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SYRO, INC.

RCRA FACILITY INVESTIGATION

REPORT

AT

SYRO, INC. FACILITY
CENTERVILLE, UTAH

VOLUME 1

DECEMBER 1994

BINGHAM ENVIRONMENTAL

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RCRA FACILITY INVESTIGATION REPORT
SYRO, INC. FACILITY
CENTERVILLE, UTAH

Prepared for
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VOLUME 1

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

EXECUTIVE SUMMARY

This RCRA Facility Investigation (RFI) Report summarizes the results of the RFI performed by Bingham Environmental for Syro Steel Company (Syro) as part of a Corrective Action Order (Consent Order). The RFI was performed according to the detailed scope of work which is outlined in the approved Work Plan dated October 25, 1990. The purpose of the RFI was to determine the nature and extent of releases of regulated constituents from six (6) potential sources at the Syro Facility located in Centerville, Utah. This report provides historical information, field and laboratory data, conclusions and recommendations for the RFI.

Syro Steel Company currently operates a steel fabrication and galvanizing facility in Centerville, Utah which has been in continuous operation since approximately 1966. The galvanizing process is the operation that has historically generated a regulated waste, which consequently created the reason for performing this RFI. Syro utilizes a sulfuric acid solution, termed pickle liquor to remove any rust and mill scale from the surface of the steel prior to coating it with zinc. Prior to installation of their existing acid recovery system, Syro had to occasionally dispose of the spent pickle liquor. Spent pickle liquor was managed by discharging through a pipeline to a surface impoundment for temporary storage prior to off-site disposal (1966 - 1983), or by discharge though a hose to a temporary storage tank (1983 - 1987).

Six potential sources of contamination were identified based on previous data and historical information. The potential sources include an initial surface impoundment to store spent pickle liquor (SWMU No. 1), a second surface impoundment (SWMU No. 2), discharge pipelines (SWMU No. 3), a former lined RCRA impoundment (SWMU No. 4), stockpiles of soil excavated from SWMU No. 4 during closure activities (SWMU No. 5) and a reported disposal area of sulfate crystals (SWMU No. 6). The three previous surface impoundments were the primary focus of this investigation. All six potential sources were investigated as part of the RFI and SWMU Nos. 1 through 5 were identified as containing some soil and/or sludge with regulated constituents above baseline concentration levels; however, SWMU No. 6 was not found to exist separately from the area identified as SWMU No. 2. Baseline concentration levels were developed based on previous and recent sampling and analysis of background areas.

Based on information collected as part of the RCRA Facility Investigation, several regulated and non-regulated inorganic constituents were identified in the soil and groundwater below and adjacent to the SWMUs and the former RCRA impoundment. In addition, a trace of two volatile organic compounds (VOCs) were detected in one groundwater sample.

Some of the regulated constituents identified in the soil and groundwater are above baseline concentration levels and groundwater protection standards; therefore, there is a potential need for corrective measures. Syro proposes to perform a Corrective Measures Study (CMS) to identify and evaluate alternatives for any corrective action necessary to prevent or mitigate any migration or release of regulated waste or constituents at or from the facility.

The RFI identified cadmium, chromium, lead and selenium above baseline concentration levels in some soil and sludge samples collected from the SWMUs and the former RCRA impoundment. SWMUs No. 1, 2, 3, 4 and 5 all exhibited elevated levels of regulated constituents and non-regulated constituents. The TCLP tests indicated that the regulated inorganic constituents are relatively immobile with only two lead concentrations slightly above the TCLP maximum concentration limit. Based on the baseline concentration levels for soil and sludge, areas of SWMUs No. 1 and 2, the discharge pipeline (SWMU No. 3), and the former RCRA impoundment (SWMUs No. 4 and 5) may require corrective measures. Syro may utilize the recently adopted Cleanup Action and Risk-Based Closure Standards during the CMS to further evaluate appropriate action levels. Although three test pits were excavated in an attempt to identify the location of the sulfate crystal disposal area, no evidence of SWMU No. 6 separate from SWMU No. 2 was identified as part of this RFI. SWMU Nos. 2 and 6 were investigated together and are referred to collectively in this report as SWMU No 2.

Some of the groundwater in the shallow aquifer system identified on Figure 19, will probably require corrective measures. There is evidence that the degree of groundwater contamination has improved over time; however, several regulated constituents are still above groundwater protection levels. The RFI identified the horizontal and vertical extent of the groundwater contamination plume. The contamination plume, based on the indicator parameters of pH, sulfate and specific conductance, has migrated approximately 600 to 700 feet to the northwest in the direction of groundwater flow as shown on Figure 19. The groundwater investigations identified cadmium, lead, nickel and zinc as the only regulated inorganic constituents above EPA MCLs. There is also an indication that chromium is present in the groundwater. Continued sampling and analysis for total chromium will enable Syro to determine if chromium is actually present in the groundwater and at what concentrations. In addition, elevated levels of non-regulated constituents included sulfate, zinc, iron, manganese and low pH values which were detected in some groundwater samples from the monitor wells. Tetrachloroethane and trichloroethane were detected in a groundwater sample from MW-6 at concentrations slightly above MCL and detection limits. These two slightly elevated VOCs do not appear to be significant, however, additional sampling and analysis of MW-6 is proposed to further evaluate the presence of VOCs in the groundwater.

The RFI also identified some elevated concentrations of non-regulated constituents in sediment and surface water samples collected in and adjacent to Ricks Ditch. One sediment sample, RCK-3, and one bank soil sample, RCK-2, detected regulated constituents above baseline concentration levels. In conclusion, Ricks Ditch exhibits elevated levels of primarily non-regulated constituents in the

sediment and surface water and the CMS should be performed to evaluate the necessity of corrective measures.

The RFI also investigated six (6) off-site groundwater sampling locations shown on Figure 9 as OS-1 through OS-6. The groundwater samples, which were collected with the HydroPunch, were analyzed in the field for indicator parameters of pH, temperature, specific conductivity and sulfate and the results are reported on Page A-121 of Appendix A. The results indicate no evidence of off-site contamination.

Based on available data and a review of existing water wells in the general area there is no risk of the existing soil, sludge and groundwater contamination affecting the water quality of the water wells.

Syro proposes to perform a Corrective Measures Study to determine if appropriate corrective actions are necessary to prevent or mitigate the impact of regulated constituents at and adjacent to the facility. The Corrective Measures Study will probably include a Risk Assessment to evaluate risked-based action levels for soil, sludge and groundwater. In addition Syro proposes to perform quarterly groundwater sampling and analysis for monitor wells MW-1 through MW-8, and DG-4, to further evaluate groundwater quality and determine if the concentrations are changing. Groundwater level measurements will also be performed at least quarterly in the monitor wells and piezometers to evaluate seasonal fluctuations in the water table.

SECTION 1

INTRODUCTION

1.1 GENERAL

A RCRA Facility Investigation (RFI) was performed by Bingham Environmental for Syro Steel Company (Syro) as part of a Corrective Action Order (Consent Order). Syro prepared and implemented a Work Plan for the RCRA Facility Investigation which consisted of a detailed scope of work for the RFI and a preliminary scope of work for the Corrective Measures Study (CMS). The purpose of the RFI was to determine the nature and extent of releases of regulated constituents from potential sources at the Syro facility in Centerville, Utah, shown on Figure 1. This report provides data, conclusions and recommendations for the RFI.

1.2 RFI OBJECTIVES AND SCOPE OF WORK

1.2.1 RFI Objectives

The purpose of the RFI was to determine the nature and extent of releases of regulated waste or constituents from the facility and to gather all necessary information to support the CMS. The RFI Work Plan addressed the following objectives:

1. Locate all sources of release of contaminants to the environment, including the RCRA impoundment and SWMUs.

2. Characterize the nature and extent of contamination both on-site and off-site, including defining the pathways and methods of migration of regulated waste or constituents with particular emphasis on groundwater and surface water contamination.

3. Identify potential receptors, and determine both the short and long term nature of the potential threat to human health or the environment.

4. Evaluate the overall integrity of existing and proposed containment structures at the site.

5. Develop sufficient information to identify and evaluate corrective measures for the prevention of releases of regulated constituents from the facility.

1.2.2 Scope of Work

The RCRA Facility Investigation consisted of five tasks which included:

TASK I:	Description of Current Conditions
TASK II:	RFI Work Plan Requirements
TASK III:	Facility Investigation
TASK IV:	Investigation Analysis
TASK V:	Reports

Section 2 provides a description of historical and current conditions to satisfy the requirements of Task I. Task II, preparation of an RFI Work Plan was completed in 1990. This RFI Report (Sections 3 through 7) addresses information obtained from the performance of Tasks III and IV.

1.3 PREVIOUS INVESTIGATIONS

Previous investigations and studies performed at Syro have been summarized in Section 2 and Appendix A of the RFI Work Plan. These investigations have included the sampling and analysis of waste pickle liquor, soils, groundwater, surface water and sediment in and adjacent to the Syro facility. The majority of the monitoring has been directed toward general assessments of potential contamination. Data collected from previous investigations was utilized in determining that a RFI was necessary to evaluate the nature and extent of potential contamination and to more efficiently define the scope of the RFI field and laboratory programs.

SECTION 2

DESCRIPTION OF CURRENT CONDITIONS

2.1 FACILITY BACKGROUND

2.1.1 General

Syro Steel Company is an Ohio corporation, qualified to do business in the State of Utah, and currently operating a steel fabrication and galvanizing facility in Centerville, Utah. The facility has been in continuous operation since approximately 1966 when it was originally operated by both Syro and National Galvanizing Company (National) until 1971. This partnership occurred as a result of Syro's interest in steel fabrication and National's interest in galvanizing. Consequently, Syro owned and operated the steel fabrication portion of the facility while National owned and operated the galvanizing portion. This arrangement was concluded when Syro purchased the entire business from National in 1971.

The manufacturing process at the Syro site is operated in three distinct areas: fabrication, galvanizing and rolling mill, all of which are maintained in separate buildings identified on Figure 2. The galvanizing process is the operation that has historically generated a regulated waste, which consequently created the reason for performing this RFI. Galvanizing of steel is accomplished by first treating the steel product to remove all rust and prepare the surface for coating with zinc. The removal of rust and mill scale is performed in a vat of heated sulfuric acid solution, termed pickle liquor. The steel is prepared for galvanizing by subsequent rinsing through immersion in water. Galvanizing is accomplished by dipping the steel into a kettle containing molten zinc.

Prior to installation of their existing acid recovery system, Syro had to dispose of the pickle liquor when the concentration of iron sulfate interfered with the activity of the sulfuric acid. Spent pickle liquor was managed by discharging through a pipeline to a surface impoundment for temporary storage prior to off-site disposal (1966 - 1983), or by discharge though a hose to a temporary storage tank (1983 - 1987). The volume of spent pickle liquor generated by the facility varied depending upon the volume of galvanizing work performed by the facility, but averaged approximately 24,000 gallons per month. Preflux was not dumped directly into the impoundment or tank, but rather was discharged to one of the two pickling vats prior to filling with pickle liquor solution.

The three previous surface impoundments at Syro were the primary focus of this investigation. Two surface impoundments were constructed and operated prior to implementation of RCRA and are

therefore defined as Solid Waste Management Units (SWMUs) No. 1 and No. 2, while the impoundment which was operated after November 19, 1980 is a Regulated Unit, referred to here as the RCRA surface impoundment and identified as SWMU No. 4. Also, two pipelines were constructed and operated for the purpose of transferring spent pickle liquor to one of the three impoundments. The pipeline which transferred waste to the RCRA impoundment and SWMU No. 2 (see Figure 2) has been partially removed during closure of the RCRA impoundment. The pipeline which transferred spent pickle liquor to SWMU No. 1 reportedly has not been removed. All remaining pipelines and the splitter box were designated as SWMU No. 3 for purposes of performing the RFI. Two additional SWMUs were identified as potential sources of contamination; SWMU No. 5 is located north of the RCRA impoundment and consists of the soil stockpiles originating from closure activities for the RCRA impoundment, and SWMU No. 6 is reported to have consisted of sulfate crystals cleaned out of the RCRA impoundment and subsequently buried on the west side SWMU No. 2.

Summary of Solid Waste Management Units (SWMUs)	
SWMU No. 1	Unlined surface impoundment southwest of RCRA surface impoundment.
SWMU No. 2	Unlined surface impoundment southeast of RCRA surface impoundment, including a reported disposal area of sulfate crystals from SWMU No. 4.
SWMU No. 3	Pipelines and splitter box.
SWMU No. 4	RCRA lined surface impoundment.
SWMU No. 5	Soil stockpiles originating from natural soils excavated from underneath the RCRA surface impoundment.
SWMU No. 6	Reported disposal area of sulfate crystals cleaned out of the RCRA surface impoundment; this SWMU was not found to exist separately from SWMU No. 2

In performing the RFI, several maps were created to depict specific features of the site. Figure 1 is provided to show the general vicinity of Syro and the surrounding area. Figure 2 identifies SWMUs No. 1, 2 and 3, the RCRA impoundment (SWMU No. 4), the soil stockpiles (SWMU No. 5) and the reported location of clean out material from the RCRA impoundment (included in SWMU No. 2). All of the facility structures including buildings, utilities, paved areas and all other pertinent features are presented in Figure 3. Available topography, surface water features and the existing monitor wells and piezometers which have been installed at the Syro site are identified on Figure 4. Figure 5 shows property ownership information for parcels adjacent to the Syro facility.

2.1.2 Historical Information

During the period when National owned and operated the galvanizing facility, spent pickle liquor

was reportedly discharged through a 6-inch diameter clay pipe (SWMU No. 3) into an unlined surface impoundment located in the southwest corner of the site (identified as SWMU No. 1 on Figure 2). This surface impoundment was constructed by excavating into the natural soils to a depth such that the spend pickle liquor may have been in contact with the water table. The pipeline originated at a floor drain inside the galvanizing building at a location just west of the pickling vats. This impoundment was reportedly dosed with lime on a regular basis to neutralize the waste and control corrosivity as evidenced by generally neutral to basic pH of sludge samples taken from SWMU No. 1 during the performance of the RFI. This impoundment was taken out of service around 1971 by neutralizing any remaining spent pickle liquor sludge or liquid with lime followed by backfilling and grading.

A second surface impoundment (SWMU No. 2) was constructed for storage of spent pickle liquor at approximately the time SWMU No. 1 was closed. This impoundment, built around 1971, was located west of the fabrication building and approximately 200 feet to the northeast of SWMU No. 1 as identified on Figure 2. SWMU No. 2 was constructed by excavating approximately 6 to 8 feet into the existing fill material. This impoundment received waste via a 6-inch diameter clay pipeline originating from a splitter box which was constructed near the west door of the galvanizing building. The splitter box was placed into service to allow for utilization of the same floor drain and piping which exited the building for discharging spend pickle liquor into SWMU No 1. The outlet from the splitter box to the SWMU No. 1 pipeline was reportedly capped at this time. Since the location of the new impoundment was upgradient from the splitter box, a sump was constructed for use as a passive lift station in transferring spent pickle liquor to storage. Like SWMU No. 1, this impoundment also received regular applications of lime spread over the surface to control corrosivity and pH. Closure of this impoundment, which occurred around 1974, was performed similar to that at SWMU No. 1, by treatment with lime, backfilling and grading. Test pit logs (Appendix A) show a depth of approximately 1 to 2 feet of remaining sludge which had been neutralized with lime, as evidenced by generally neutral to basic pH of sludge samples taken from with SWMU No. 2 during the performance of the RFI.

In 1974 Syro constructed a third impoundment for storage of spent pickle liquor. This impoundment (identified as the RCRA impoundment on Figure 2) was constructed with a 30 mil Hypalon liner placed over a minimum 6-inch base of compacted sand. As protection for the liner, a layer of compacted sand was placed to a depth of approximately one foot over the surface of the liner and steel plate was placed over the sand to allow limited access to the impoundment without damaging the liner. Waste was transferred to the RCRA impoundmentvia the same pipeline used for SWMU No. 2 with the exception that the pipeline extending from the sump to SWMU No. 2 was removed, and a new 8-inch diameter clay pipe was installed between the sump and the RCRA impoundment.

The RCRA impoundment, measuring approximately 55 feet by 140 feet by three feet deep, was

designed to hold approximately 130,000 gallons of spent pickle liquor. Details of this impoundment were provided in the RFI Work Plan, Section A.8 of Appendix A. Through the passage of time a significant build up of iron sulfate crystals formed on the bottom of the RCRA impoundment, necessitating a clean out to reestablish the design capacity. Personal communication with facility personnel indicates that this clean out was accomplished in 1980 prior to the implementation of RCRA. This clean out utilized a track hoe for removal of the iron sulfate crystals. These crystals were reportedly placed in a shallow excavation immediately to the east of the RCRA impoundment and on, or in close proximity to, SWMU No. 2. This disposal site (SWMU No. 6) was reportedly dosed with lime for stabilization and neutralization prior to being covered with dirt and graded. No evidence of crystals or lime neutralized sludge was found during the performance of the RFI.

Upon implementation of RCRA in 1980, Syro submitted a Part A application for operation of a surface impoundment for storage and treatment of waste pickle liquor from steel finishing operations (K062). Syro also notified the EPA in August 1980 that it was a generator of K062. Spent pickle liquor was generally sent to Chevron Chemical in Salt Lake County for beneficial reuse, though occasionally Syro sent the waste to a hazardous waste disposal site operated by U.S. Pollution Control, Inc. in Tooele County, Utah.

No waste was discharged into the RCRA impoundment after January, 1983. Syro received approval of a closure plan from the Utah Department of Environmental Quality (UDEQ) on October 19, 1983 and began implementation of the closure plan by removing all waste, sludge, liner, and portions of the clay pipe used to transfer waste to the RCRA impoundment. Contaminated soils were removed also, but due to a disagreement with the UDEQ concerning the extent of contamination, closure activities ceased pending resolution of contamination issues. Contaminated soils were stockpiled north of the RCRA impoundment while awaiting determination from UDEQ regarding an appropriate waste classification. In March, 1988, as a result of EPA clarification regarding the application of K062 waste to the iron and steel industry, the UDEQ changed the designation of the waste generated at the Syro facility from a listed hazardous waste (K062) to a characteristic hazardous waste, and subsequently Syro submitted a revised closure plan that has not been approved by the UDEQ. Syro intends to resubmit a closure plan including schedules for completion after the RFI has been performed.

Syro installed an acid treatment system in 1987 which effectively eliminated the generation of spent pickle liquor from the facility. Spent pickle liquor is now generated on a periodic or one-time basis only as a result of operational problems with the acid treatment system. Any spent pickle liquor generated by Syro is designated a hazardous waste identified as D002 (Corrosive); additional D-waste designations may be made depending upon the results of analysis. Waste rags contaminated with methylene chloride and perchloroethylene is the only waste stream generated at Syro which is a listed hazardous waste; however, since this waste is generated at a quantity less than 100

kilograms per month, Syro is a conditionally exempt small quantity generator except when the spent pickle liquor is disposed in bulk. No listed hazardous waste is currently generated at Syro; the only by-product of the acid treatment system is iron sulfate crystals which do not exhibit the characteristics of a hazardous waste.

2.2 NATURE AND EXTENT OF CONTAMINATION

2.2.1 Solid and Hazardous Waste Management Units

2.2.1.1 Locations - Figure 14 identifies the locations of the unlined impoundments (SWMUs No. 1 and 2), a section of the pipeline (SWMU No. 3), the RCRA surface impoundment (SWMU No. 4) and the soil stockpiles (SWMU No. 5). No evidence was found of the RCRA surface impoundment clean out site (SWMU No. 6), and only a section of clay pipe (SWMU No. 3) was found, as shown in Figure 14. The RFI Work Plan addressed a storm water outfall area as a potential source of contamination from "...roof and floor drains from the fabrication building." This information was incorrect since no floor drains are connected to the storm water drainage system.

2.2.1.2 Estimated Quantities - Piles of excavated soil (SWMU No. 5) from the closure of the RCRA impoundment are still stored on site, but these soils have been tested and found not to exhibit any of the characteristics of a RCRA hazardous waste (Appendix C). The estimated volume of soil in SWMU No. 5 is 300 cubic yards.

Both of the unlined surface impoundments (SWMU No. 1 and 2) were closed by stabilizing the solid waste in place. Evidence from drill holes and test pits show that the remaining sludge were effectively neutralized with lime. The results from test pits and drill holes at each SWMU indicates that both sites have from one to three feet of sludge remaining over the area of the SWMU. The volume of SWMU No. 1 and 2 was estimated based on an average sludge thickness of 2 feet; SWMU No. 1 contains approximately 666 cubic yards based on dimensions of 60 ft. by 150 ft. by 2 ft., and SWMU No. 2 contains approximately 118 cubic yards based on dimensions of 40 ft. by 40 ft. by 2 ft.

Two sections of pipeline (SWMU No. 3) that apparently still exist are along a portion of the original alignment to SWMU No. 2 and the entire portion of pipe to SWMU No.1. The length of remaining pipe to SWMU No. 2 is estimated to be as long as 200 feet and approximately 235 feet of pipe to SWMU No. 1 still exists, as shown on Figure 14. Sample results from underneath the small section of the clay pipe to SWMU No. 2 indicate the presence of elevated levels of regulated constituents in the soil. Sample results from underneath the clay pipe to SWMU No. 1 are all below baseline levels.

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2.2.1.3 Contamination Constituents - The spent pickle liquor which was originally placed in storage at the Syro facility exhibited the hazardous waste characteristics of corrosivity and EP toxicity for metals. The regulated constituents arsenic, cadmium, chromium and lead were present in the spent pickle liquor.

Spent pickle liquor sludge, a combination of spent pickle liquor, lime and iron sulfate crystals, has been previously sampled and analyzed. The sludge exhibited the characteristic of an EP toxic hazardous waste for chromium and selenium. Further data collected as part of this RFI is summarized in Section 5.

2.2.2 Summary of Facility Contamination

Soil, sludge, sediment and groundwater have been sampled and analyzed as a part of the RFI. The results of these samplings (Appendix C) suggest we implement a Corrective Measures Study.

2.2.2.1 Migration Pathways - As shown on Figure 14, the SWMUs are all located in the west-central portion of Syro site. There is evidence that regulated and non-regulated inorganic constituents have migrated from SWMUs No. 1, 2, 3 and 4 causing soil contamination levels above baseline concentration levels. Groundwater has been contaminated by several regulated constituents above MCL's.

The contamination released from the SWMUs appear to have followed migration pathways consisting of (1) vertical movement into the subsurface natural soils and groundwater and (2) lateral movement on surface soils and in surface water into subsurface soils and groundwater.

The Syro facility is located on a relatively thick deposit of unconsolidated lacustrine soils which is made up of alternating layers of silts, clays and sands with occasional gravels. The upper 15 to 20 feet typically consists of silts and clays which exhibit relatively low vertical permeability and moderate horizontal permeability. The natural soils exhibit an affinity for cations and therefore tend to adsorb some of the cationic metals when the waste seeps through them. Fill materials were utilized throughout much of the site and the majority of the fill appears to consist of coarser grained sand and gravel material. (See Appendix B, Physical Laboratory Testing)

The hydrogeology consists of multiple aquifers below the site. The most immediate is the shallow unconfined aquifer located between near the ground surface to 4 feet below the original (natural) ground surface and extending down on the order of 25 to 30 feet. The groundwater gradient slopes down toward the northwest. The water in this aquifer is generally poor quality, containing moderate to high amounts of dissolved solids. Principal sources of recharge to the aquifer are from direct infiltration due to precipitation and upward seepage of water from the deeper confined aquifer. The

deeper confined aquifer is generally encountered below a depth of 40 to 50 feet below the ground surface and extends to several hundred feet. This aquifer, when penetrated by wells, tends to exhibit artesian pressures well above the ground surface; i.e. the deeper aquifer is hydrologically upgradient of the shallow unconfined aquifer.

The original topography at the site consisted of a gentle downward slope in a northwesterly direction. The majority of the area, where the buildings, the RCRA impoundment, SWMU No. 2 and the storage yard south of the buildings are located, has been constructed with fill which exhibits higher permeability characteristics than the natural soils. Existing topography is presented on Figure 4 which indicates that the surface still slopes slightly downward to the west-northwest. Ricks Ditch, located along the western boundary of the active facility, is used primarily for irrigation delivery; however, it also transports storm water during precipitation and runoff events.

Based on information gained during performance of the RFI, regulated and non-regulated constituents appear to have migrated through both the fill and natural subsurface soils and into the shallow groundwater system. There is no evidence of groundwater contamination in the deeper confined aquifer.

The sediment in Ricks Ditch show evidence of elevated levels of zinc; one sample of sediment also exceeded the baseline concentration level for cadmium, and one bank sample exceeded the baseline concentration level for chromium. Surface water samples collected from the ditch show elevated levels of iron, manganese, zinc and sulfate when compared to EPA drinking water standards.

2.2.2.2 Potential Receptors - Any release of regulated constituents from the site to surface or groundwater has the potential of reaching a limited population of significant target organisms. Surface water flowing through Ricks Ditch could be ingested by domestic livestock downstream, as well as a varied population of wild animals including rodents, reptiles, game birds and raptures.

The use of surface water by livestock is limited to stockwatering of horses in an area north of the site and another area west of Child Lane. No dairy stock has access to the surface water which crosses the site. Potential contamination from either groundwater or surface water could have an effect on existing agricultural activities. However, the constituents available for potential release are not known to have a significant effect on plant life at the low concentration levels found during the performance of the RFI.

All surface water and groundwater impacted by the site is eventually deposited in the Great Salt Lake. The Farmington Bay Bird Refuge is located to the northwest adjacent to the Great Salt Lake. The wildlife which uses this habitat may be a potential receptor population affected by a release of contamination constituents.

SECTION 3

FIELD INVESTIGATIONS AND LABORATORY ANALYSES

3.1 GENERAL

This section includes information developed as part of the field program for the RCRA Facility Investigation performed at the Syro Steel Company facility. The majority of the field program was performed between April 1991 and December 1991. Bingham Environmental (Bingham) hydrogeologists and/or engineers supervised all field activities. The locations of all monitor wells, piezometers, exploratory drill holes, groundwater sampling and soil sampling performed as part of this study and from previous studies are shown on Figures 7, 8 and 9.

3.2 EXPLORATORY DRILL HOLES

The exploratory drill holes consisted of fifty six (56) HydroPunch groundwater sampling holes of which eight holes were continuously sampled and logged and five were completed as piezometers. The 56 groundwater sampling holes are identified as DH-1 through DH-51 which were drilled in or adjacent to the Site at the locations shown on Figures 7 and 8 and OS-1 through OS-6 which were drilled at off-site locations shown on Figure 9. DH-5 was not drilled and DH-4, DH-11, DH-16, DH-41, DH-42, DH-43, DH-44 and DH-45 were continuously sampled and logged with DH-41 through DH-45 completed as piezometers. The drilling of these holes began on April 17, 1991 and continued through November 15, 1991. The drilling program was conducted using an Acker Soil Sentry drill rig operated by Bedke Drilling Company and a CME 75 drill rig operated by Overland Drilling Company. The drill holes were advanced using 7.25-inch and 8.25-inch outside diameter continuous hollow stem augers.

A Bingham hydrogeologist and/or engineer supervised the drilling operations during the duration of the drilling program. They located the holes, logged the subsurface soils encountered and obtained relatively undisturbed and disturbed soil samples and collected discrete groundwater samples. The soil samples were obtained using a CME continuous sampler with lucite tubes or using a standard penetration sampler (SPT). The discrete groundwater samples were obtained using a HydroPunch sampler. All samples were recorded on the drill hole and/or penetrometer logs which are included in Appendix A. The penetrometer logs provide an interpretive description of soil in drill holes where only "HydroPunch" groundwater samples were collected. The soil interpretation is based on soil observed on the augers and bearing pressure on the tip of the HydroPunch sampler while penetrating the subsurface soils. During drilling operations all equipment was cleaned with high pressure hot potable water to minimize the potential for cross contamination.

3.3 MONITOR WELLS

Based on groundwater quality data obtained from discrete sampling with the HydroPunch sampler and evaluation of the existing DG- Wells, six (6) monitor wells, identified as MW-1 through MW-6, were initially located and installed to monitor the groundwater contamination plume in the shallow, unconfined aquifer and at selected locations that might serve as further remedial treatment wells. These monitor wells were continuously sampled and logged and completed between November 19 and November 22, 1991. Upon further evaluation and discussions with the UDEQ and the U.S. EPA (EPA) two additional monitor wells, identified as MW-7 and MW-8 (new upgradient well), were installed on April 18, 1994 . In addition, the UDEQ, EPA and Syro concluded that existing monitor wells DG-1, DG-2, DG-3, DG-5, DG-6 and the Syro Well were inadequate for use in performing groundwater monitoring and consequently the wells were permanently abandoned on April 19 and 20, 1994. Monitor well locations are provided on Figure 7B, Monitor Well Network.

Monitor well completion was accomplished with the installation of 2-inch or 4-inch diameter flush-coupled schedule 40 PVC pipe with 0.010-inch machine slotted screen in the bottom 10 to 15 feet. The annulus was backfilled with #16-40 Colorado silica sand to a minimum height of 2 feet above the screened interval. A bentonite pellet plug a minimum of two (2) feet thick was placed over the sand filter. The remaining annulus was backfilled with a cement-bentonite slurry. A protective concrete pad and locking steel casing were constructed at the surface of the monitor wells. Illustrations of monitor well completion details are presented as part of Appendix A. MW-1 through MW-5, MW-7 and MW-8 were completed using 2-inch diameter PVC pipe and MW-6 was completed using 4-inch diameter PVC pipe.

The monitor wells were allowed to stabilize for a 24-hour period prior to development. The wells were developed by removing several well volumes of water with a 1 1/2-inch or 3-inch diameter PVC bailer. Bailing was continued until the water was relatively clear of sand and other sediments. Bailing revealed that the wells were recharging at medium to high rates.

Existing monitor well DG-4 was also included in the monitor well network. A drill hole log and well completion detail is provided in Appendix A of this report. The UG-Well (the former upgradient well replaced by MW-8) was not considered reliable in evaluating groundwater quality and will be utilized to collect groundwater level data.

3.4 SLUG INJECTION TESTS

Slug injection tests were performed on four (4) piezometers identified as DH-41, DH-42, DH-43 and DH-45 on July 12, 1991 and nine (9) monitor wells identified as MW-1 through MW-6, DG-4, UG-well and Syro well on January 8, 1992 to estimate horizontal hydraulic conductivity values for

the shallow, unconfined aquifer system. Each test consisted of injecting a known volume of previously bailed water back into the well as rapidly as possible and then measuring the depth to water as the water level stabilized back to its original static level. The tests were performed using automatic water level monitoring and logging equipment which provided accurate water level measurements during the recovery phase. Results of the tests have been tabulated and plotted and are included in Appendix A.

The data was analyzed using methods developed by Hvorslev (1951), Bouwer (1972), Cooper, et al (1967) and Ferris and Knowles (1963). A summary of the hydraulic conductivity values estimated from the slug tests is provided in Appendix A along with the aquifer length the well is screened over and the analysis method(s) used to estimate the hydraulic conductivity.

3.5 SURVEYING

Bingham performed surveying of all monitor wells, piezometers, exploratory drill holes, test pits, soil sampling and surface water sampling locations at the site, as part of the field program. The surveying included determining the horizontal coordinates and vertical elevations of these exploratory and sampling points. All vertical control was based on USGS datum and the horizontal control was based on a local coordinate system. The six off-site exploratory drill holes were not surveyed and the locations have been estimated on Figure 9. A table included in Appendix A provides a summary of the monitor well, piezometer, exploratory drill hole and test pit locations and elevations.

3.6 GROUNDWATER MEASUREMENTS

Water levels have been measured in the existing and new monitor wells throughout the field program. This includes measurements performed during the drilling of each exploratory hole and in all completed wells and piezometers on July 30, 1991, December 2, 1991, February 24, 1992, August 25, 1992, June 4, 1993 and June 6, 1994. Water level measurements were determined using an electronic well probe. Each measurement is referenced to the top of the PVC casing (TOC) which was surveyed so that groundwater elevations could be determined. The monitor well and piezometer water level elevations are tabulated in Appendix A. Groundwater elevations from December 2, 1991 and June 6, 1994 water level measurements were used to develop groundwater contour maps, Figures 15A and 15B, which indicates a direction of groundwater flow to the northwest. The groundwater elevations are also shown on hydrogeologic cross sections, Figures 11, 12 and 13.

3.7 ENVIRONMENTAL SAMPLING AND ANALYSES

3.7.1 Soil and Sediment

Soil and sediment samples were collected in and adjacent to Solid Waste Management Units (SWMU) No. 1 through No. 5, Ricks Ditch and the background soil sampling grid located in the northeast and southeast corners of Syro's property.

Soil samples were collected using stainless steel spoons, standard penetration samplers (SPT), CME continuous sampler, or a stainless steel soil and sediment sampler. Samples were collected from test pits, drill holes or from the surface at locations shown on Figures 7, 8, 9 and 10. Sample depths are recorded on test pit and drill hole logs provided in this Appendix A. All sampling of soil and sediment was performed in strict accordance with the Quality Assurance Project Plan outlined in Appendix C of the Syro Work Plan, which included decontamination of all sampling and testing equipment between samples.

Sludge samples obtained from SWMUs No. 1 and No. 2 and soil samples from SWMUs No. 3 and 5 were analyzed in the laboratory for the selected parameters in Table 1. Natural soil samples obtained outside SWMUs No. 1, 2, and 4 and the background samples were analyzed for the selected parameters in Table 2. Soil samples collected from underneath SWMUs No. 1, 2, 5 and within 4 were analyzed for selected parameters in Table 3. Sediment samples collected in and adjacent to Ricks Ditch were analyzed for parameters listed in Table 4.

3.7.2 Groundwater

3.7.2.1 General - Discrete groundwater sampling and analysis in exploratory drill holes DH-1 through DH-51 and OS-1 through OS-6 were used to delineate the vertical and horizontal extent of the potential groundwater contamination plume. All of the samples were field analyzed for the indicator parameters pH, specific conductivity, sulfate and temperature. Results of the indicator parameters were compared to project specific action levels (pH - <6, specific conductivity >4000 umhos/cm and sulfate >2000 mg/l) and if found above these levels the groundwater in that area was considered to have elevated levels of regulated and non-regulated constituents. To validate field analysis results four discrete samples were also analyzed by a certified laboratory and compared with the associated field analysis. The results are summarized in Table 16 and Section 3.8.4 provides a discussion on the field and laboratory analysis comparison. In addition, three discrete samples were selected to compare the results of field filtered and unfiltered samples. These samples were analyzed for the parameters indicated on Table 5 with the results summarized on Table 17. Based on the laboratory analyses, the filtered and unfiltered results appear to compare relatively well with the filtered samples typically showing slightly lower concentrations. The groundwater sampling

and analysis performed on the monitor wells was based on filtered samples. The following sections describe sampling and analytical procedures in more detail.

3.7.2.2 Exploratory Drill Holes - Groundwater samples from the exploratory drill holes were collected by drilling to a depth approximately one foot below the groundwater table, at which time a groundwater sample was obtained directly from the hollow-stem auger using a peristaltic pump. After the initial groundwater sample was collected, a sampling device called a HydroPunch was used to obtain discrete groundwater samples from permeable lenses and layers in the shallow aquifer. As the holes were augured to a particular depth, the HydroPunch was pushed between two (2) to ten (10) feet below the bottom of the auger, and the screened portion of the sampler opened to the formation. After the sampler was allowed time to fill the HydroPunch was removed and the groundwater sample transferred into a container for field analyses.

Each discrete groundwater sample was field tested for indicator parameters pH, specific conductivity, sulfate and temperature. Field indicator results are summarized in tables provided in Appendix A titled Field Indicator Results for Groundwater Samples.

Four exploratory drill holes located 100 feet beyond the potential plume of contamination (based on indicator parameter results) were sampled and analyzed for selected parameters shown on Table 5. Laboratory results are summarized on Table 18.

The sampling equipment was steam cleaned between each sample collection to insure that cross contamination did not occur. After completion of the groundwater sampling the exploratory drill hole was backfilled with bentonite to prevent vertical migration of potential contamination.

3.7.2.3 Monitor Wells - Initial groundwater samples were obtained from MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, DG-4, the Syro Well, and the Upgradient (UG) Well on December 4 and 5, 1991 and analyzed for selected chemical constituents listed on Table 6. Based on discussions with UDEQ and EPA, the Syro Well was determined unreliable in evaluating groundwater quality and was removed from the monitor well network and subsequent sampling events. The UG Well was also removed from the monitor well network and will be utilized as a piezometer to monitor water levels, however, the UG Well may be sampled on occasion for water quality data in that area. The UDEQ and EPA also felt that DG-4 was suspect in its reliability due to deterioration of the surface apron and protective cover. The surface completion problem was recently repaired and DG-4 is currently being assessed. Subsequent sampling events of MW-1 through MW-8 and DG-4 was performed on May 10 and 11, 1994, August 9 and 10, 1994 and November 8 and 9, 1994. The UG Well was sampled during the November 1994 event. Laboratory results of these sampling events are summarized on Table 19.

Good

Prior to sampling and testing, the water level was measured and at least three casing volumes of water removed from each well. Water was removed from the monitor wells using a PVC bailer. Specific conductivity, temperature and pH were monitored during the bailing and sampling process and a final reading was obtained prior to and after sample collection. Field measurements performed during groundwater sampling are on file. Once the wells had been bailed, the water level was allowed to return to approximately its original level, at which time samples were collected. Samples were obtained from the monitor wells using a teflon bailer.

3.7.3 Surface Water Sampling

Four (4) surface water samples were collected from Ricks Ditch at locations shown on Figure 7. The water samples were placed directly into the sample bottles using standard surface water sampling practices. Surface water samples were analyzed for the parameters listed on Table 7. No surface water samples were collected from the outfall area of the storm water drainage system since no surface water was observed.

3.8 FIELD QUALITY ASSURANCE/QUALITY CONTROL

3.8.1 Equipment Decontamination

All appropriate precautions were taken to ensure sample integrity during drilling and sampling events. All drilling and sampling equipment was steam cleaned between each drill hole and sampling event. Monitor well sampling equipment was decontaminated with Alconox solution, a non-phosphate detergent, and triple-rinsed with distilled water between samples.

3.8.2 Sample Preservation

All samples were placed in Class A environmental containers provided by American West Analytical Laboratory (AWAL). The samples were stored in a cooler at 4°C until hand delivered to AWAL for analysis.

3.8.3 Chain of Custody

Samples selected to be sent to AWAL for analysis were hand delivered under strict chain of custody protocol.

3.8.4 Field Analysis Validation

Field analysis for the indicator parameters were compared to a certified laboratory analysis and the

results compare reasonably well. Field equipment used to measure sulfate was similar to equipment used by the laboratory and the sulfate results show the closest correlation.

Field analysis for pH during the HydroPunch sampling performed in 1991 was hampered by calibration problems with the testing equipment. Some of the measurements performed in May 1991 may be suspect, indicating a possible bias low result.

3.9 LABORATORY QUALITY ASSURANCE/QUALITY CONTROL

3.9.1 Field Blanks

Rinsate and field blanks (trip blank) were collected in association with the monitor well sampling. During the December 1991 sampling event the rinsate blank was designated as MW-7.During the May 1994 sampling event the rinsate blank was designated as MW-10. The rinsate blanks indicate no evidence of sample contamination problems with the exception of minor detectable concentrations of iron, zinc and chloroform in sample MW-10.

The iron and chloroform are close enough to the laboratory detection limits to be considered estimates and more than likely due to laboratory interferences. The zinc concentration appears to be valid and indicate that the decon procedures may not be removing potential contaminants effectively.

3.9.2 Field Duplicate

A field duplicate was collected from MW-1 and submitted to AWAL under the blind sample identification of MW-8 during the December 1991 groundwater sampling event. During the May 1994 groundwater sampling event a field duplicate was obtained from MW-6 and given a blind sample identification of MW-9. Comparison of the duplicate sample indicates a good correlation for all parameters with the exception of iron, potassium, chromium VI and TOC during the December 1991 sampling event.

3.10 PHYSICAL LABORATORY TESTING

3.10.1 General

The physical testing of selected soil samples was performed by Bingham Engineering's material testing laboratory. The testing program consisted of Atterberg limits, moisture and density determinations, porosity, and grain size analysis.

3.10.2 Atterberg Limits

Atterberg limits determinations were performed as an index to soil behavior, to aid in correlating various other test data and to aid in classifying samples. The results of the determinations are provided in Appendix B.

3.10.3 Grain Size Analysis

Standard mechanical grain size analysis was performed on selected soil samples obtained in conjunction with the field investigations. The test procedures consisted of washing a representative portion of each sample through a No. 200 sieve and recording the percent dry weight of the material passing the No. 200 sieve. Then the remaining sample, retained above the No. 200 sieve, was evaluated by a mechanical method to determine the percent by dry weight retained on selected sieve sizes. The results of these tests are presented on Figures in Appendix B.

3.10.4 Moisture, Density and Porosity Determinations

Moisture, density and porosity determinations were performed in order to aid in classifying materials and to correlate other hydrogeologic properties. The results of these tests are summarized on a table in Appendix B.

SECTION 4

HYDROGEOLOGY

4.1 GENERAL

The Syro facility is located on fine-grained silty sand and silty clay soils. A shallow aquifer extends from near the ground surface to a depth of 25 to 30 feet. A deeper, confined aquifer, which is located below the shallow aquifer, is effectively separated from the shallow aquifer by low permeability clay and clayey silt layers. The State of Utah Groundwater Quality Protection Regulations classify both aquifers as Class II, Drinking Water Quality Ground Water based on available groundwater quality data. The subsurface soils exhibit low vertical and moderate horizontal permeabilities. A known active fault is located approximately 1.4 miles east of the site.

4.2 REGIONAL GEOLOGY AND HYDROGEOLOGY

The Syro site is located in the Basin and Range physiographic province which is characterized by north-trending mountain ranges separated by elongated valleys. Subsurface conditions in the vicinity of Syro is characterized by thick sequences of alluvial and lacustrine unconsolidated deposits. The Wasatch Mountains include an active fault zone known as the Wasatch Fault which is located approximately 1.4 miles from the site.

The subsurface soils consist of fine-grained lacustrine silt and clay deposits with coarser-grained sands and gravels increasing with depth below 100 feet and increasing toward the east, adjacent to the Wasatch Mountains. Recharge to the aquifer(s) is through these sand and gravel deposits where they are exposed near the Wasatch Mountains.

The variable nature of the lacustrine deposits, which comprise the aquifer system in the general area of Syro, makes the exact delineation of aquifers and aquitards a difficult task. Typically, however, there is an upper, shallow aquifer in the upper 20 to 30 feet separated from a deeper, confined aquifer by a layer of silty clay material. Recharge to the deeper aquifer is from infiltration into the sand and gravel deposits adjacent to the Wasatch Mountains, while recharge to the shallow aquifer is from direct infiltration from the surface and upward flow of water from the deeper aquifer. Water in the aquifers has slight to moderate levels of total dissolved solids (TDS) in the range of 300 ppm to 1500 ppm. The shallow aquifer exhibits higher TDS than the deeper aquifer, with the TDS decreasing with depth.

4.3 HYDROGEOLOGY AT FACILITY

A shallow unconfined aquifer extends to approximately 25 to 30 feet below natural ground at the Syro site. The shallow aquifer is primarily recharged by precipitation, seepage from Ricks Ditch and upward vertical seepage from the deeper confining aquifers (Bolke and Waddell, 1972, Waddell, et al, 1987). Below the shallow unconfined aquifer, several confining layers exist which probably extend horizontally to the Wasatch Mountain Range.

An inventory of private water wells in the vicinity of Syro was performed in August and September of 1988 and updated in 1992. Information was obtained from the Utah State Engineer's office which included water rights applications filed with the Utah Division of Water Rights and available well logs. This information was compiled and a site reconnaissance performed to confirm and supplement the data. The results of the well inventory are summarized in Appendix A. Examination of well drillers' logs for wells installed in the vicinity of the Syro property shows that the potentiometric head generally increases with depth at a rate greater than hydrostatic in the deeper, confined aquifer(s) as shown on Figure 20. The wells located within 1000 feet of the Syro property show a potentiometric head ranging from 15 to 35 feet above the ground surface in wells screened in aquifers 150 to 400 feet below ground surface. This indicates that an upward potential for vertical seepage exists. This upward vertical gradient and the low permeability layer(s) provide an effective barrier so that contaminants can not migrate from the shallow unconfined aquifer into the deeper aquifer(s). Bingham's conclusion is that the deeper aquifer is located hydraulically upgradient of the shallow aquifer.

4.4 TOPOGRAPHIC FEATURES

The Syro site is located on ground which has a downward, natural gentle northwest slope. Much of the site has been filled, thus altering the gradient of the natural ground surface. The eastern property line appears to be at natural grade. Fill thicknesses increase westwardly reaching depths of approximately 6 to 8 feet, though continually sloping downward to the northwest. The extent of fill can be clearly seen from the western portion of the property. Review of aerial photographs indicate that fill has been added several times in an effort to expand the limits of the storage area to the west. The RCRA impoundment has been built in fill material by forming an embankment.

A drainage ditch (Ricks Ditch) has been excavated west of SWMU #1 and the RCRA Impoundment. It is fed by a corrugated metal pipe which diverts water from an irrigation canal south of Porter Lane. The ditch drains north to just past an existing chain link fence north of the facility where it turns west to Child Lane. A swale is located between the RCRA impoundment and the soil stockpiles and flows into Ricks Ditch. The swale is fed by another corrugated metal pipe which carries storm runoff from the fabrication building roof and floor drains. The swale is usually dry

throughout most of the year.

4.5 SHALLOW, UNCONFINED AQUIFER SYSTEM

The shallow, unconfined aquifer consists of the upper 25 to 30 feet of lacustrine and alluvial deposits. Detailed stratigraphy is provided on the hydrogeologic cross sections, Figures 11 through 13. The groundwater surface ranges from 1/2 to 10 feet below the ground surface and extends to depths on the order of 25 to 30 feet. The unsaturated zone is almost non-existent in the areas surrounding and down gradient of the SWMU No. 1 and the RCRA Impoundment because of the high water table.

The shallow, unconfined aquifer is characterized by alternating layers of sandy clay, silty clay, and silty sand lenses. The upper 3 to 6 foot thick sandy and silty clay layer over lies a 1 to 2 foot thick of relatively continuous water bearing silty sand layer (upper sand layer). Below this silty sand layer the exploratory holes encountered a 3 to 5 foot thick silty clay layer overlying a silty sand layer (lower sand layer) of various depths and thickness. This silty sand layer appears to be 15 to 16 feet thick in the immediate area of the RCRA Impoundment but decreases in thicknesses (2 to 3 feet) to the west and northwest as shown on Figures 12 and 13 and to the north and south as shown on Figure 11. The lower sand layer over lies a continuous silty clay layer consisting of discontinuous sand lenses and has thicknesses ranging from 3 to 20 feet. Below the this silty clay layer exploratory holes encountered a sand layer between 28 to 32 feet below the ground surface (total thickness unknown) which is not considered part of the shallow, unconfined aquifer. This sand layer exhibits artesian conditions as evident by the flowing monitor well DG-1 which was completed within this lower sand layer.

Due to the alternating lenses of sand and clay, the hydraulic conductivity is typically 100 to 1000 times higher in the horizontal direction than in the vertical direction, with much of the water moving through the upper and lower silty sand layers. A confining layer is believed to exist between 30 and 100 feet below the natural ground surface. Available well logs indicate a thick clay layer at this depth.

Figures 11, 12 and 13 are cross sections that illustrate the distribution of the shallow hydrogeologic units beneath the site. Cross section locations are shown on Figure 7A, Exploration Location Map. The cross sections are based on lithologies logged in monitor wells, piezometers and exploratory holes drilled during the investigation. Drill hole logs, monitor well and piezometer completion details of recent drilling and well installation, performed by Bingham Environmental, are found in Appendix A.

4.6 GROUNDWATER FLOW REGIME

4.6.1 Groundwater Levels

Water level measurements from piezometers and monitor wells located both in and adjacent to the site were obtained during and subsequent to the investigation. These measurements indicate that the shallow, unconfined groundwater surface is within a few feet of natural ground at the eastern boundary of the site to less than a foot from the ground surface near the western end of the site. The flow of groundwater in the shallow aquifer is in a northwesterly direction below the site as shown on Figures 15A and 15B. Groundwater fluctuations are on the order of 2 to 4 feet, however, the direction of groundwater flow is consistently toward the northwest.

4.6.2 Groundwater Gradients

4.6.2.1 Horizontal Hydraulic Gradients - Horizontal hydraulic gradients, expressed as a dimensionless ratio, were calculated from the groundwater contour map by dividing the vertical change in water level by the linear distance. The horizontal hydraulic gradient ranges from 0.009 to 0.03 in the shallow, unconfined aquifer with the average horizontal hydraulic gradient approximately 0.017 feet/foot.

4.6.2.2 Vertical Hydraulic Gradients - The vertical gradient was estimated between the shallow and deeper aquifers by dividing the difference in potentiometric head by the distance between the depths of the wells. Figure 20 was utilized to obtain potentiometric head and well depth values and the vertical hydraulic gradient is estimated to be on the order of 0.12 feet/foot.

4.6.3 Groundwater Velocity

The velocity and volume of groundwater flow can be estimated using Darcy's Law and the velocity equation of hydraulics.

$$Q = kiA \text{ (Darcy's Law)}$$
$$v = Q/A = Ki \text{ (velocity equation)}$$

where: Q = rate of flow per unit time (gpd)
K = hydraulic conductivity (gpd/ft^2)
A = cross sectional area perpendicular to the flow direction (ft^2)
i = hydraulic gradient

v = velocity (ft/yr)
n = porosity

The velocity equation must be adjusted for porosity which results in:

$$v = \frac{ki}{n}$$

Horizontal groundwater velocities were calculated for all monitor wells for which slug injection tests were performed. A summary of these results is listed in Table 8.

Horizontal velocity calculations indicate that the velocity of the groundwater ranges from 2.3 ft/year to about 22 ft/year with the average horizontal velocities being on the order of 9 ft/yr which is a low to moderate velocity.

4.7 GROUNDWATER FLOW PATHS

The groundwater flow paths through the unconfined, shallow aquifer are govern by the confining characteristics or lower permeability of the silty clay layers. The presence of the alternating clay and sand layers produces a hydraulic conductivity orders of magnitude greater in the horizontal direction than in the vertical direction. As the contaminant (pickle liquor) was introduced into the shallow, unconfined aquifer the pickle liquor typically migrated vertically downward, due to a higher specific gravity than water, until it reached the higher permeable sand layers. Because of the confining nature of the clay layers, the contaminant migration tending to migrate horizontally through the sand layers. Much of the contamination of the upper sand layer is probably due to the vertical migration of the pickle liquor through the upper sandy clay layer which exhibits a relatively higher permeability than the silty clay layers. However, there is strong evidence that the contamination of the lower sand layer is attributable to the vertical migration of contaminants in the DG wells. It appears that all of the DG wells screen and sand pack intervals were completed across the upper and lower sand layers of the unconfined, shallow aquifer providing a pathway for the contamination to migrate vertically downward.

4.8 GROUNDWATER QUALITY

The groundwater in the shallow, unconfined aquifer is seldom used for domestic or industrial purposes because of its low yield and poor water quality (Seiler and others, 1984). The water quality of the shallow, unconfined aquifer is generally moderate in TDS with moderate to high concentrations of carbonates, chloride, sulfate, calcium, magnesium, potassium and sodium. Other

constituents found in the shallow groundwater that have contributed to its poor water quality are arsenic, iron, lead and manganese and to a lesser extent cadmium, chromium and copper (Seiler and others, 1984, p. 32-33).

The groundwater underneath the Site appears to follow this general characterization with TDS values ranging between 800 mg/l and 1500 mg/l, the presence of elevated levels of the major ions and the presence of lead, manganese and nickel (see UG Well, Table 12). Based on the background water quality at the Site the State of Utah Ground Water Quality Protection Regulations classify the shallow, unconfined aquifer as Class II, Drinking Water Quality Ground Water.

4.9 SURFACE WATER AND SEDIMENT

4.9.1 Regional Surface Water Hydrology

The Farmington Bay of the Great Salt Lake (GSL) is located less than 6000 feet to the west-northwest of the Syro site. The GSL reached a record high water elevation of 4212 feet in 1984. This brought the surface water within 3000 feet of the Site. There are no rivers or natural streams within a mile of the site. Water from Ricks Ditch eventually flows into the Great Salt Lake.

4.9.2 Facility Surface Water

Ricks Ditch is the only surface water course on Syro's property. It has only intermittent flows (1) during runoff events and (2) when water is diverted from the irrigation canal. The irrigation canal is located near the southeast corner of the site. A turnout structure in the canal enables water to be diverted along an irrigation ditch which runs along the south side of and parallel to Porter Lane. Another turnout in this ditch allows for the diversion of water into a 10-inch corrugated metal pipe (CMP) which traverses the Syro property and empties into the south end of Ricks Ditch, see Figure 4. Figure 4 also provides available 100 and 500 year flood projections. Ricks Ditch would not be inundated during 100 or 500 year precipitation events.

Several stormwater catch basins, which drain into the 10-inch CMP, are located along the western edge of the paved area and between the existing Syro office buildings. Another CMP which empties into Ricks Ditch carries water from roof and floor drains from the fabrication building.

4.9.3 Sediment

Sediments in Ricks Ditch originate from the irrigation water, the catch basins in the storm sewer system, erosion of the ditch banks, and overland flow of sediments from storm events and erosion. Much of the sediment is probably due to erosion of the fill material upslope of Ricks Ditch.

SECTION 5

CONTAMINATION ASSESSMENT

5.1 GENERAL

Syro conducted the RFI for the purpose of characterizing the environmental setting, sources of contaminant release, degree and extent of contamination and the identification of any real or potential receptors. This investigation achieved the objective of collecting sufficient data of adequate technical content to support the development and evaluation of corrective measure alternatives during implementation of the Corrective Measures Study (CMS).

The RFI activities adhered to the tasks identified as Task II of the Work Plan. All sampling and analyses were conducted in accordance with the QAPP, and were adequately documented throughout the project. Personnel were properly trained in the implementation of site safety requirements and procedures.

5.2 EVALUATION OF BACKGROUND VALUES FOR SOIL AND GROUNDWATER

5.2.1 Background Soil Sampling

Background soil samples were obtained during three separate sampling events, performed during 1983, 1984 and 1991. In the 1983 sampling event, twelve soil samples were collected from grids H2 and H9; during the 1984 sampling event fifteen soil samples were collected at depths ranging from near the surface to approximately two feet below ground surface in grid areas D2, E2, G9, F2 and F9 (see Figure 10 for grid locations).

In an effort to establish a statistical correlation with previous results, additional soil sampling was performed in 1991 which consisted of nine samples, six from grid H1 and three from grid H9. Three of the samples obtained from grid H1 were collected from a one foot interval beginning at depths ranging from 1.3 feet to 1.9 feet, and three samples were collected from a one foot interval beginning at depths ranging from 2.9 feet to 3.5 feet. The three samples collected from grid H9 were collected from a one foot interval beginning at depths ranging from 0.5 feet to 1.2 feet. Results are provided in Appendix C and summarized in Table 14.

All sample results were tested for statistical comparability and the results indicated that samples taken from grid H2 during 1983 were not statistically reliable. The decision was jointly made by Syro, EPA and UDEQ to utilize all background soil data with the exception of results obtained from grid H2 during the 1983 sampling event. The results of all the representative background

soil analyses are provided on Table 20.

5.2.2 Background Groundwater Sampling

One upgradient well has been constructed and sampled at the Syro facility, designated as background monitor well UG. Nine groundwater samples were obtained from this well during the period 21 Feb 84 through 22 Aug 88; constituents analyzed consisted of all or part of the EPA primary and secondary drinking water standards plus the additional parameters of nickel, phenol, sodium, TOC and TOX. One additional background sample was collected on December 4, 1991 as part of the RFI. Table 19 summarizes the parameters and analytical results of the background groundwater sample taken during the RFI.

The groundwater in the shallow, unconfined aquifer is generally characterized as poor in water quality with relatively high TDS and containing contaminants from industry and agriculture. The water quality of the shallow, unconfined aquifer under the site appears to follow this general characterization with TDS values ranging between 800 mg/l and 1500 mg/l. The State of Utah Ground Water Quality Protection Regulations classify the shallow, unconfined aquifer as Class II, Drinking Water Quality Ground Water based on available groundwater quality data.

5.3 CRITERIA FOR EVALUATING SOIL AND GROUNDWATER CONTAMINATION

5.3.1 General

Data analysis methods have been defined in Section 6 of the RFI Work Plan. These methods were developed to establish baseline concentration levels for soil contamination and action levels for groundwater contamination.

5.3.2 Soil Baseline Concentration Levels

Background soil data was analyzed statistically to establish Upper Contamination Limits (UCL). The UCL for each contaminant parameter was determined by calculating the harmonic mean plus three standard deviations.

The resulting background UCLs are summarized in Table 21:

TABLE 21

SOIL BASELINE CONCENTRATION LEVELS

	Parameter	Baseline Concentration Level (mg/kg)
Regulated Constituents	arsenic	100
	cadmium	0
	chromium	85.6
	lead	93
Non-Regulated Constituents	iron	37,494
	zinc	574
	manganese	531
	nickel	97
	sulfate	721
	pH (units)	7.2 - 9.4

5.3.3 Groundwater Action Levels

The RFI Work Plan set groundwater action levels in accordance with the proposed EPA Subpart S regulations of 40 CFR Part 264.521. These proposed regulations did not include Action Levels for all constituents of concern, but did establish Action Levels for various organic contaminants and the inorganic parameters of arsenic, cadmium, lead, nickel and selenium.

Although the EPA is no longer proposing the Subpart S regulations, the Action Levels are still appropriate due to being based on EPA maximum contaminant levels (MCLs). The appropriate RFI Action Levels are presented in Table 22 for regulated constituents which were detected in groundwater samples at levels above the laboratory quantification limit.

TABLE 22
GROUNDWATER PROTECTION LEVELS

Parameter	Action Level (mg/l)
arsenic	0.05
cadmium	0.005
chromium	0.1
lead	0.015
nickel	0.1
selenium	0.05
tetrachloroethane	0.005
trichloroethane	0.005

5.4 SOURCE CHARACTERIZATION

5.4.1 Potential Sources

Although six potential sources of contamination were investigated, only five potential sources were identified during performance of the RFI. These five potential sources are identified on Figure 14 as the closed surface impoundment in the southwest corner of the property (SWMU No. 1), the closed surface impoundment immediately west of the fabrication building (SWMU No. 2), the clay pipeline west of the galvanizing building (SWMU No. 3), the RCRA surface impoundment (SWMU No. 4) and the soil stockpile immediately north of the RCRA impoundment (SWMU No. 5). The investigation focused on the six potential sources as well as Ricks Ditch and the shallow groundwater in, around and downgradient of the potential sources. No additional sources were discovered during the field investigation, and the sulfate crystal disposal area (SWMU No. 6) was not found to exist separately from SWMU No. 2.

The RFI found no evidence of contamination from the building storm water discharge system which discharges untreated precipitation runoff from the manufacturing buildings and wash-down water from the floor sump collection drains in the fabrication building.

Characterization of all the potential sources was accomplished by determining the location, vertical and areal extent of the source boundaries, and subsequent representative sampling of each potential

source. The following sections provide site specific information for each of the original six potential sources.

5.4.2 Solid Waste Management Units 1 and 2

5.4.2.1 Historical Information - The approximate locations and dimensions of these two SWMUs are shown on Figure 8, and are based on exploratory excavations and drill holes, available drawings, aerial photographs and communication with facility personnel. The two unlined surface impoundments were used for the storage of spent pickle liquor from around 1966 through approximately 1974. These two impoundments were constructed by excavation into natural silt and clay soils. Both impoundments received spent pickle liquor via discharge through a buried pipeline (SWMU No. 3). Lime was periodically spread over the surface of the impoundments to neutralize the pickle liquor. Each impoundment was removed from service by (1) ceasing the practice of discharging to the impoundment, (2) allowing evaporation of liquid, (3) treating with lime, and (4) backfilling and grading. SWMU No. 2 also has been reported as a site for disposal of sulfate crystals from the RCRA impoundment (SWMU No. 4).

5.4.2.2 Excavating, Drilling and Sampling - SWMU No. 1 was investigated using both excavation and drilling techniques. Four test pits identified as TP-SM1-1 through TP-SM1-4 were excavated to a depth of approximately six feet, one pit on each side and extending from the residual wastes within the SWMU to the soil outside of the SWMU. Test pit logs are provided in Appendix A, Field Program. Six drill holes were placed in the SWMU identified as SM1-DH1 through SM1-DH6 to a depth of approximately 10 feet, at locations shown on Figure 8. Samples of soil and sludge were collected from the test pits and drill holes to determine contamination constituents, and the results of analyses are provided in Appendix C, Laboratory Analyses.

The residual waste pickle liquor sludge remaining in SWMU No. 1 is confined to a layer ranging from approximately one to three feet in thickness extending over an area measuring approximately 40 feet by 120 feet. No information is available which shows groundwater elevations at the site during the time of operation of this SWMU; however, groundwater was encountered in the test pits and drill holes at a depth ranging from 4.3 feet to 5 feet from surface grade.

SWMU No. 2 was also investigated using both excavation and drilling techniques. Four test pits identified as TP-SM2-1 through TP-SM2-4 were excavated to depths from 7 to 8.5 feet in a manner similar to the test pits in SWMU No. 1. Five drill holes were placed in SWMU No. 2, identified as SM2-DH2 through SM2-DH6, extending to depths ranging from eight to fifteen feet, at locations shown on Figure 8.

The residual waste pickle liquor sludge remaining in SWMU No. 2 was identified in only two drill

holes, but based on sludge depths found in test pits, appears to range across the entire area of SWMU No. 2 approximately one to two feet in thickness. This SWMU measures approximately 50 feet by 80 feet. No information is available showing groundwater elevations at the site during the period of operation; however, groundwater was encountered in test pits at a depth ranging from 5.8 feet to 7.5 feet below the ground surface.

5.4.2.3 Analytical Results - The analytical results for SWMUs No. 1 and 2 are summarized in Tables 9 and 10. The laboratory data sheets are provided in Appendix C.

Regulated constituents - Laboratory analysis on sludge samples obtained from drill holes and test pits inside SWMU No. 1 indicate lead levels above the baseline concentration levels of 234.5 mg/kg, ranging in concentrations between 250 mg/kg and 3600 mg/kg. One of the TCLP samples exceeded the MCL for lead by 1 mg/l. Laboratory results for samples collected in native soil under and outside SWMU No. 1 indicate two samples with elevated levels of chromium (100 mg/kg and 130 mg/kg) slightly above the baseline concentration level of 83.7 mg/kg.

SWMU No. 2 results indicate cadmium, chromium, lead and selenium above baseline concentration levels in some of the sludge samples collected from drill holes and test pits inside the impoundment. Cadmium concentrations above baseline concentration levels ranged between 28 mg/kg and 35 mg/kg, with a baseline of 8.7 mg/kg. Chromium concentrations above baseline concentration levels ranged between 86 mg/kg and 140 mg/kg. Lead concentrations above baseline concentration levels ranged between 610 mg/kg and 19,000 mg/kg. Selenium concentrations were 0.2 mg/kg with the baseline concentration level of 0 mg/kg. One of these samples indicated an exceedance of the MCL level for TCLP lead by 1.5 mg/l. Laboratory results of samples collected in native soil under and outside SWMU No. 2 indicate one sample with an elevated level of 160 mg/kg for chromium, which slightly above baseline concentration level of 83.7 mg/kg.

Non-Regulated constituents - Laboratory analysis on sludge samples and native soil samples under and outside of SWMU No. 1 indicate manganese (1,400 mg/kg), zinc (between 560 mg/kg and 11,000 mg/kg) and sulfate (1,000 mg/kg and 4,500 mg/kg) levels above baseline concentration levels of 731, 549.7 and 690.7 mg/kg, respectively.

SWMU No. 2 sludge and natural soil sample results indicate levels of iron, zinc and sulfate above baseline concentration levels.

5.4.3 SYRO Pipelines (SWMU No. 3)

5.4.3.1 Historical Information - Spent pickle liquor was transferred to the SWMU impoundments and the RCRA impoundment via a 6-inch clay pipeline identified on Figure 2. This pipeline originated at the galvanizing building and ended at each impoundment.

One section of pipe, which ended at SWMU No. 1, was reportedly installed around 1966 at the approximate time that SWMU No. 1 was constructed and placed into service. This pipeline originated at the floor drain just west of the pickling vats, and proceeded westerly to the impoundment. Initial efforts to locate this pipeline during the field investigation in 1991 were unsuccessful, however, during the recent excavation for a new sewer line in April 1994 a portion of pipeline was uncovered, approximately 40 feet west of the galvanizing building. The pipeline was initially scoped with a pipe camera to determine its extent east to the galvanizing building and west to SWMU# 1. To the east the pipeline was observed to within 5.5 feet of the galvanizing building where the end of pipe appeared to be obstructed with concrete. To the west the camera was able to scope approximately 50 before being obstructed with what appeared to be sludge. Further excavation work was performed which located the remaining pipeline to SWMU # 1, as shown on Figure 8.

The section of pipe which extended to SWMU No. 2 and the RCRA impoundment was originally constructed around 1971, and modified around 1974. This pipeline originated at a junction, or splitter box, located just outside and west of the galvanizing building. The box reportedly capped off the pipeline to SWMU No. 1, which was substantiated during the recent camera pipe scoping in April 1994, and routed spent pickle liquor northerly to a point approximately in line with the northern boundary of the galvanizing building, then northwesterly via a 45 degree elbow joint approximately 250 feet to a concrete sump which was used as a passive lift station. This sump continued the clay pipeline at a higher level and along the same alignment to SWMU No. 2. When SWMU No. 2 was removed from service, this extension was also removed, and a new extension of eight inch clay pipe extended west from the sump approximately 60 feet to an elbow, thence at a 45 degree angle to the RCRA impoundment.

Sections of the pipeline have been removed during various closure operations. The section of pipeline extending from the sump to SWMU No. 2 was removed around 1974. The eight inch pipeline extending from the sump to the RCRA impoundment was removed in 1983, as was the sump and the pipe extending from the splitter box to the 45 degree elbow near the galvanizing building. It is reported that a section of pipe approximately 15 feet in length was removed upstream from the sump at the location shown on Figure 2.

Figure 2 identifies which sections of pipeline and other pumping facilities which have reportedly

been removed. Soil under and around portions of the pipeline which was excavated and removed for disposal may have been contaminated with spent pickle liquor. Personal communications with Syro personnel indicate that when sections of pipeline were removed any visually contaminated soil was also removed and disposed of. There is no information in the existing record which indicates that testing, analysis or removal of soils under and around the remaining pipeline to SWMU No. 1 has been performed.

5.4.3.2 Excavating and Sampling - Syro initially excavated trenches at random locations where the pipeline reportedly existed. Three trenches (TP-SM3-2, TP-SM3-3 and TP-SM3-4) between the galvanizing building and SWMU No. 1 were excavated perpendicular to the pipeline alignments with a small backhoe. No indication of the existence of this pipeline was discovered, however, in April 1994 during the excavation and installation of a new sewer line the pipeline was located south of the assumed alignment. Three additional trenches (TP-SM3-5, TP-SM3-6 and TP-SM3-7) were excavated to confirm the location of the pipeline as shown on Figure 8. In addition, an eighth excavation (TP-SM3-1) located a portion of the pipeline that fed SWMU No. 2, as shown on Figure 8. Soil samples were collected underneath the pipe and sent to a certified laboratory for chemical analysis. In addition, one sludge sample was collected from inside the pipeline located between the galvanizing building and SWMU# 1 and sent to the laboratory for chemical analysis.

Upon completion of the sampling all of the trenches were backfilled with the excavated material and the existing pipelines were left intact. Removal of the pipeline and surrounding material will be assessed as part of the Corrective Measures Study.

5.4.3.3 Analytical Results - The analytical results for SWMU No. 3 are summarized on Table 11. The laboratory data sheets are provided in Appendix C.

Regulated constituents - Laboratory results of the soil samples obtained from trenches TP-SM3-1, TP-SM3-5, TP-SM3-6 and TP-SM3-7 obtained underneath the pipe indicates elevated levels (total metals) of cadmium at concentrations slightly above the baseline concentration levels of 0 mg/kg. Lead was also observed to be above the baseline concentration level in trench TP-SM3-1. There was no indication of TCLP metals above laboratory detection limits with the exception of lead in trench TP-SM3-7 at 0.006 mg/L which is well below the MCL of 5 mg/L.

Laboratory results of the sludge sample obtained from inside the pipe indicates elevated levels (total metals) of cadmium (1.5 mg/kg), lead (18,000 mg/kg) and selenium (0.7 mg/kg) above baseline concentration levels of 0 mg/kg, 93 mg/kg and 0 mg/kg, respectively. The only indication of TCLP metal for the sludge sample was for lead at 8.1 mg/L exceeding the MCL of 5 mg/L.

Non-Regulated constituents - Laboratory results indicate elevated levels of zinc (11,000 mg/kg) and sulfate (2,200 mg/kg) above baseline concentration levels of 549.7 mg/kg and 690.7 mg/kg, respectively from the soil sample collected from trench TP-SM3-1. All other results from soil samples were below baseline concentration levels.

5.4.4 RCRA Surface Impoundment and Soil Stockpiles (SWMUs No. 4 & 5)

5.4.4.1 Historical Information - The location of the RCRA surface impoundment and the stockpiles have been well defined as shown on Figure 2, both subjectively (visual evidence) and objectively (field survey). Soil samples had previously been taken from the bottom of the excavated impoundment and surrounding area and from the stockpiles. Information collected prior to this study concerning the location and waste characterization of the RCRA impoundment and stockpiles can be found in Section A.6 of Appendix A of the SYRO Work Plan (October 1990).

Further characterization studies were performed of the RCRA impoundment and soil stockpiles in an effort to verify the results of previous studies. This additional work involved more soil sampling in and adjacent to the impoundment and piles, and analysis for regulated constituents that may have been released to the environment.

The RCRA impoundment, originally designed to hold approximately 130,000 gallons of spent pickle liquor, measured approximately 55 feet by 140 feet by 3 feet. The impoundment was built on granular fill material, with a thirty (30) mil Hypalon liner resting on and covered by sand layers. Spent pickle liquor was transported to the impoundment by pumping through a series of two pipelines and a sump which functioned as a passive lift station (see Figure 2). Operating freeboard was not established until implementation of RCRA in 1980, after which time one foot of freeboard was required at all times.

The RCRA impoundment was placed into service around 1974. It was temporarily taken out of service around 1976 when it exhibited a significant lack of capacity due to precipitation of iron sulfate crystals which were consequently cleaned out. In the summer of 1980 the impoundment was again temporarily taken out of service to clean out precipitated iron sulfate crystals. The RCRA impoundment was permanently taken out of service in January, 1983 after which time no additional waste was placed in it. Closure operations began in the summer of 1984 and resulted in the removal of all residual waste, waste sludge, synthetic liner, base sand, and several feet of soil from under the liner. The waste pickle liquor sludge, synthetic liner, and base sand were manifested to USPCI Grassy Mountain Facility in Tooele County, Utah. The soils removed from below the level of the liner were stockpiled (SWMU No. 5) in close proximity and to the north of the RCRA impoundment. Closure was not completed pending resolution of a disagreement with the UDEQ concerning the extent of contamination removal. This issue has not been resolved.

5.4.4.2 Existing Conditions - The current condition of the impoundment is as an unprotected dry excavation shown on Figure 4. The berm surrounding the impoundment precludes run-off from the impoundment basin, though run-off can occur from the top of the berm in a westerly direction. No waste or waste by-products are stored or have been placed in the unit since it was removed from operation.

Evidence shows iron staining of some of the soils on the inside slope of the impoundment berm. This staining may have occurred as a result of overtopping from wave action when the impoundment was full of spent pickle liquor. Closure operations in 1984 apparently did not remove all soil that exhibited such iron staining.

5.4.4.3 Soil Sampling - Any residual contamination which may still be present was detected during this study by measurement of the following parameters: arsenic, cadmium, chromium, lead, manganese, selenium, nickel and zinc. Soil samples obtained for chemical analysis were selected in both a biased and an unbiased manner. Three grab samples (RCI-5, RCI-6 and RCI-7) were taken from areas of visual iron staining within the RCRA impoundment (biased), and four samples were (RCI-1 through RCI-4) taken at specific locations within the impoundment (unbiased). In addition, two samples (RCI-11 and RCI-12) were collected on the north and south insides of the impoundment, 2 to 3 feet below the surface. To address the potential for contamination in the soils outside of the impoundment, three samples (RCI-8, RCI-9 and RCI-10) were collected approximately one foot away from the outside edge of the dike embankment on the north, south, and west sides. A sample was not taken from the east side because no definite embankment exists there. Six locations (SSP-1 through SSP-6) in the stockpiles were randomly selected within a grid system, and three grab samples (SM5-1, SM5-2 and SM5-3) were collected from the soil beneath the piles.

5.4.4.4 Analytical Results - The analytical results for SWMUs No. 4 and 5 are summarized in Tables 12 and 13.

Regulated constituents - Laboratory analyses on the surface samples taken inside the RCRA impoundment showed slightly elevated levels of cadmium (1.2 times the baseline concentration level), and lead which was slightly above the baseline concentration level. Analyses of samples taken from 2 to 3 feet below the surface of the impoundment and outside of the impoundment showed levels below the baseline concentration level for all regulated constituents.

Laboratory analyses on the unbiased samples taken from the soil stockpiles showed levels of cadmium slightly above the baseline concentration level, and slightly elevated levels of lead (1.9 times the baseline concentration level). Analyses of samples taken from below the synthetic liner in the natural soil showed levels below the baseline concentration level for

all regulated constituents.

Non-Regulated constituents - Laboratory analyses on the surface samples taken inside the RCRA impoundment showed elevated levels of zinc (45 times the baseline concentration level), and sulfate (2.5 times the baseline concentration level). Analyses of samples taken from 2 to 3 feet below the surface of the impoundment showed elevated levels of sulfate (2.6 times the baseline concentration level), and zinc only on the north (18.2 times the baseline concentration level). Analyses on samples taken outside of the impoundment on the north and west showed slightly elevated levels of zinc (1.7 times the baseline concentration level), and elevated levels of sulfate on the north side (3.8 times the baseline concentration level).

Laboratory analyses on the unbiased samples taken from the soil stockpiles showed elevated levels of zinc (22.4 times the baseline concentration level), and sulfate (3.43 times the baseline concentration level). Analyses of samples taken from below the synthetic liner in the natural soil showed elevated levels of zinc (5.3 times the baseline concentration level), and sulfate (3.2 times the baseline concentration level).

5.4.5 Sulfate Crystals Cleaned Out of the RCRA Surface Impoundment (included in SWMU No.2)

5.4.5.1 Historical Information - The RCRA Surface Impoundment was constructed in 1974. Through passage of time a significant build up of iron sulfate crystals formed on the bottom of the RCRA impoundment, necessitating a clean out to reestablish the design capacity. Personal communication indicates that the clean out was accomplished in 1980 prior to the implementation of RCRA. This clean out utilized a track hoe for removal of the iron sulfate crystals. These crystals were reportedly placed in a shallow excavation immediately to the east of the RCRA impoundment and on, or in close proximity to, SWMU No. 2. This disposal site (originally identified as SWMU No. 6), was reported to have been dosed with lime for stabilization and neutralization prior to covering with dirt and final grading; however, no evidence of SWMU No. 6 was found separate from SWMU No. 2.

5.4.5.2 Excavating and Sampling - The clean out site from the RCRA impoundment was reported to be located on, or in close proximity of SWMU No. 2 east of the RCRA impoundment. Three test pits were excavated during the RFI investigation, as shown on Figure 8, in an attempt to locate the clean out area. Construction debris was the only material found in the three excavations. No environmental samples were collected.

5.4.6 Ricks Ditch

5.4.6.1 Historical Information - Ricks Ditch, which is an intermittent irrigation ditch and channel for storm water is the primary surface water body in the study area. The ditch is located topographically below the potential sources of contamination. SWMU No. 1 was located immediately adjacent to Ricks Ditch, as shown on Figure 2, and seepage and/or overtopping of the impoundment could have released contaminants into the ditch.

Prior to this study, surface water and sediment from Ricks Ditch were collected and analyzed to determine if they had been contaminated by Syro or other off-site sources. The majority of this data was summarized in Section A.5 of Appendix A of the SYRO Work Plan (October 1990). This data indicated that the surface water and sediment in Ricks Ditch contain elevated levels of iron, lead and zinc.

Although information has been collected which indicates that the surface water and sediment have elevated levels of metal constituents, no information was available concerning the horizontal and vertical extent of the contamination. Ricks Ditch has been cleaned out several times by excavating the sediment and placing it adjacent to the ditch; therefore, the extent of elevated levels of regulated constituents in the sediment may extend several feet on each side of the present ditch banks. The sediments appear to exhibit elevated levels of regulated constituents from where the irrigation water is piped to the south part of the ditch north at least to a point where the ditch changes direction and heads to the northwest. Additional data was needed to further define the horizontal and vertical limits of contamination for both the surface water and sediment.

5.4.6.2 Existing Conditions - The surface water in Ricks Ditch flows from south to north. The water flows under Child Lane and to agricultural land to the west northwest of Syro as shown on Figure 7. Potentially contaminated surface water, therefore, flows off-site to the west of Syro and eventually into the Great Salt Lake.

Sediment probably does not migrate from the ditch, except during high storm runoff events, or it may be transported by wind during dry, windy weather conditions.

5.4.6.3 Sampling - Appendix A of the SYRO Work Plan (October 1990) summarizes previous data on the chemical composition of surface water samples obtained from the irrigation canal, Ricks Ditch, and the sediment in Ricks Ditch. This information was supplemented by analyzing additional samples of water and sediment to determine COD, conductivity, TOC, alkalinity, acidity, TSS, TDS, pH and concentrations of contaminants.

Specifically, the sampling consisted of collecting four (4) samples of surface water (RCK-1, RCK-3,

RCK-5 and RCK-6) from Ricks Ditch. Because flow in the ditch is intermittent, sampling opportunities are limited; therefore, an upstream water sample was not collected during the RFI, and no upstream water quality data is presented here. However, a sample will be collected as soon as possible. Sediment sampling consisted of obtaining a total of four (4) samples (RCK-1 through RCK-4) from the ditch bottom and two (2) samples (RCK-2 and RCK-4) from the banks along Ricks Ditch.

5.4.6.4 Analytical Results - The analytical results for Rick's Ditch are summarized in Table 15. Laboratory analyses on the surface water samples taken in Rick's Ditch showed levels below the MCL's, except for lead in one location. Sample location RCK-5, which is immediately downgradient from the former SWMU No. 1 showed a lead concentration 8.2 times the MCL.

Laboratory analyses on the sediment samples taken from the bottom of Rick's Ditch showed elevated levels of zinc (14.1 times the baseline concentration level), sulfate west of SWMU No. 4 (1.7 times the baseline concentration level), and iron (6.3 times the Baseline concentration level).

Laboratory analyses on the soil samples taken from the banks of Rick's Ditch west of SWMUs No. 1 and No. 4 showed elevated levels of zinc (3.7 times the Baseline concentration level), sulfate west of SWMU No. 4 (2.6 times the Baseline concentration level), and iron west of SWMU No. 4 (1.2 times the Baseline concentration level). Slightly elevated levels of chromium were also found west of SWMU No. 4.

5.5 CONTAMINATION CHARACTERIZATION

5.5.1 General

Spent pickle liquor has apparently been released from the SWMUs since 1966. The majority of the waste was probably released from the unlined surface impoundments between 1966 and 1974 prior to usage of the lined RCRA surface impoundment. Spent pickle liquor apparently was released both to surface soils and water in Ricks Ditch and to subsurface soil and groundwater in and adjacent to the SWMUs.

Based on excavation work and sampling, the pipeline has released spent pickle liquor into the subsurface materials surrounding the pipe.

A significant amount of data had previously been collected to assess whether the spent pickle liquor had contaminated the site soils, surface water and groundwater. This data indicated that some of the subsurface soil and groundwater has apparently been contaminated by constituents typically found in pickle liquor. Previous and recent investigations performed both within the Syro site and

on adjacent off-site land indicate the shallow groundwater has been contaminated and that the contamination is migrating downgradient off-site. The RFI assessed the vertical and horizontal extent of soil and groundwater contamination and estimated to velocity of groundwater plume movement.

5.5.2 Soil Contamination

5.5.2.1 General - Section 5.4 has addressed the characterization of potential sources and their impact to soils above the water table in the vicinity of the contaminant release, i.e. adjacent to and underneath the SWMU impoundments, the pipelines, the soil stockpiles and Ricks Ditch. The physical and chemical properties of the potential sources and surrounding soil were measured to determine the potential mobility of the contaminants in the soil above the groundwater table. The following sections discuss the findings of the soil contamination investigation.

5.5.2.2 Extent of Contamination - In determining the extent of contamination it is appropriate to distinguish between regulated constituents and non-regulated constituents that have been released. In terms of the regulated constituents, typically in pickle liquor, i.e. arsenic, cadmium, chromium, lead and selenium, it appears that elevated levels of cadmium, chromium and lead above baseline concentration levels have been identified within the potential source areas, as shown on Figure 14, and elevated levels were not discovered in natural or fill soils below or adjacent to the SWMUs. The immobility of the regulated constituents, are supported by the TCLP results of source material samples. Of the several analyses performed only two samples indicated TCLP lead levels (6.9 mg/l and 7.5 mg/l) slightly above the MCL standard of 5.0 mg/l. All other TCLP results were either well below the MCL or less than detected.

Non-regulated constituents, such as iron, zinc and sulfate appear to be more mobile than the regulated constituents found in the source material. Iron, zinc and sulfate were found in both source material and natural and fill soil at elevated levels above baseline concentration levels. The vertical extent of the non-regulated constituents extends to the groundwater table underneath the SWMUs, which is located approximately 5 to 7.5 feet below the ground surface. The horizontal extent probably extends several feet beyond SWMUs No. 1, 2, 4 and Ricks Ditch in the down dip direction of ground surface gradient.

5.5.2.3 Contaminant and Soil Chemical Properties - The chemical properties of the spent pickle liquor are documented in Section A.7 of Appendix A. In summary, the waste was acidic (pH on the order of < 0.1 to 0.6) with elevated levels of arsenic, cadmium, chloride, chromium, iron, lead, manganese, nickel, zinc, and sulfate.

Available information for the natural soils at the site indicate that the soils typically consist of clay,

silt and sand layers in the upper, unsaturated zone. These soils exhibit relatively low vertical and moderate horizontal permeability characteristics. The on-site fill soils are estimated to exhibit higher vertical and horizontal permeabilities.

5.5.2.4 Regulated and Non-Regulated Concentrations - Regulated and non-regulated concentrations are summarized on Tables 9 through 15 and have been discussed in detail in Section 5.4.

5.5.3 Groundwater Contamination

5.5.3.1 General - Initial groundwater investigations performed at the site indicated that the shallow, unconfined aquifer had been impacted by elevated levels of regulated and non-regulated constituents. This was evidenced by a significant reduction in pH and increases in cadmium, chromium, lead, zinc and sulfate. The RFI investigation was conducted to further define the horizontal and vertical extent of the contamination plume, movement and velocity of the contaminant plume, factors influencing movement of the plume and future contamination movement. Action levels previously discussed in Section 5.3.3 and summarized on Table 22 were used to evaluate the potential groundwater contamination.

5.5.3.2 Field and Laboratory Investigations - Section 3 provides a detailed description of the field investigation activities and laboratory analyses. Generally, the vertical and horizontal extent of the groundwater contamination was evaluated by obtaining discrete groundwater samples with HydroPunch sampling equipment from several exploratory holes and providing verification through the drilling, installation and sampling of several monitor wells.

The majority of the discrete groundwater samples were analyzed in the field for specific conductivity, sulfate, pH and temperature. Results of the indicator parameters were compared to action levels (pH≤6, specific conductivity ≥4000 umhos/cm and sulfate ≥2000 mg/l) and if found in exceedance of the levels the groundwater in that area was considered to have elevated levels of regulated and non-regulated constituents. The field measurements for the indicator parameters are summarized in tables provided in Appendix A. Four discrete groundwater samples were also analyzed in the laboratory to compare with field measurements, and the result summarized in Table 16. Several of the discrete samples were also analyzed to compare filtered vs. unfiltered with results included in Table 17. Table 18 summarizes laboratory results of discrete groundwater samples obtained from exploratory holes located approximately 100 feet beyond the projected edge of the contamination plume as illustrated on Figure 19. Monitor well groundwater sample analytical results from samples obtained in December 1991, May 1994, August 1994 and November 1994 are summarized on Table 19. All laboratory data sheets are provided in Appendix C.

The reasonable correlation between field and laboratory analysis for the indicator parameters indicate that the field results are reliable. The filtered vs. unfiltered sample results demonstrate good correlation. The results of the discrete groundwater samples obtained from exploratory holes 100 feet beyond the contamination plume show that all of the indicator parameters are below the RFI action levels. However, slightly elevated levels of cadmium, iron and manganese indicate some influence from the contaminant plume. Based on the relatively low horizontal groundwater velocities the plume should not change significantly in a 2 to 3 year period.

Monitor wells MW-1, MW-3, MW-4 and MW-5 were located at the perimeter of the plume (based on the results of the HydroPunch field indicator samples, refer to Figure 19) in November 1991 to verify the horizontal extent of the contamination. In addition, MW-7 was located several feet downgradient of the plume in April 1994 to monitor potential movement of the plume since the initial RFI field investigation in 1991. Laboratory results of groundwater samples obtained from these wells indicate slightly elevated levels of iron and manganese above secondary MCLs. MW-5 groundwater sample obtained in December 1991 indicated an elevated level of lead above MCLs at 0.13 mg/l. However, more recent samples obtained in May, August and November 1994 shows no lead above the laboratory detection limit. Monitor wells MW-2, MW-6 and DG-4 located in or near potential sources identified during the RFI show initial concentrations of cadmium, iron, lead, nickel, manganese and zinc above MCLs. The subsequent sampling in May 1994 indicate that lead concentrations are non-detect or below laboratory detection limits. MW-6 also revealed slightly elevated levels of tetrachloroethene and trichloroethene at 11 ug/l and 9.6 ug/l, respectively (December 1991), and 20 ug/l and 14 ug/l, respectively, (May 1994).

In the initial sampling of monitor wells MW-1 through MW-6 and the UG Well performed in December 1991, EPA requested that Syro analyze for chromium VI instead of total chromium. The results indicated elevated levels of chromium VI above detection limits. There is concern of the validity of these values because 1) historical data shows that the UG Well has never indicated the presence of chromium and 2) the field duplicate sample result indicated poor correlation with the original sample demonstrating a 53 percent difference (duplicate samples should fall within the +/- 20 % range). Groundwater sampling performed in August 1994 indicated the presence of total chromium in some of the wells but at concentrations below MCLs. Other sampling events performed in 1994, however, indicate that there was no detection of total chromium above laboratory detection limits in sample results from the May 1994 and November 1994 events (refer to Table 19). Continued sampling and analysis for total chromium will enable Syro to determine if chromium is actually present in the groundwater and at what concentrations.

5.5.3.3 Contamination Plume - The horizontal delineation of the contamination plume as shown on Figure 19 is based on indicator parameter results (specific conductance, sulfate and pH) obtained during the RFI field investigation and the plume area was confirmed by the monitor well results.

The contaminant plume has apparently migrated in the direction of groundwater flow, which is to the northwest. Figures 16 through 18 present isoconcentration contour maps for specific conductance, sulfate and pH in the shallow, unconfined aquifer. The three parameters exhibit a similar plume shape west and northwest of the SWMUs. The groundwater contamination plume has been identified as extending to the north and west boundaries of the Syro site; however, there is no evidence the plume extends off-site.

The vertical extent of the contaminant migration was evaluated by obtaining groundwater samples at multiple depths in the exploratory holes again using indicator parameters as determinants. As discussed in Section 4 the stratigraphy at the site consists of silty clay and silty sand layers. The primary water bearing zones are the upper silty sand layer at 4 to 6 feet which appears to extend continuously throughout the site and the lower silty sand layer at 8 to 25 feet, with varying thickness and intermittent silty clay layers, as shown on hydrogeologic cross sections, Figures 11 through 13. The contamination has migrated vertically to both the upper and lower silty sand units but appears not to extent beyond a maximum depth of 28 feet at the Site. Twenty-two HydroPunch exploratory holes penetrated a dense sand layer located at a depth of 28 to 32 feet and results of the indicator parameters were indicative of a Class 1 aquifer (TDS less than 500 mg/l) and levels well below the upgradient monitor well's (MW-8) specific conductivity and sulfate levels.

5.5.3.4 Contamination Movement - Based on the data the contamination plume is moving downgradient through the upper and lower silty sand layers toward the northwest. The plume is moving primarily in a horizontal direction and a relatively impermeable silty clay layer between 26 and 30 feet and 10 and 30 feet, depending on the thickness of the lower sand layer, and an upward gradient characteristic of the hydrologic units below 28 feet as discussed in Section 4.7, is inhibiting the vertical movement downward.

5.5.3.5 Velocity - The horizontal velocities at the Site have been discussed in Section 4 and summarized on Table 8. In general the horizontal velocities of the groundwater ranges from 2.3 ft/yr to about 22 ft/yr with the average horizontal velocities being on the order of 9 ft/yr. Based on the direction, gradient and the highest calculated velocity of groundwater flow the northwestern edge of the groundwater plume appears to be consistent with release(s) from the potential source areas over the past 25 years.

5.5.3.6 Concentration Profiles - Concentration profiles for appropriate Appendix IX constituents were not prepared because the constituents were not consistently found in the groundwater at concentrations above MCLs at the Site.

5.5.3.7 Factors Influencing Movement of Plume - Based on hydrogeologic data collected during the RFI three main factors, horizontal gradient, horizontal velocity and thickness of the water

bearing zones, would influence movement of the plume. The horizontal hydraulic gradient is relatively flat at the Site and doesn't appear to vary seasonally. The average horizontal hydraulic gradient in the shallow unconfined aquifer is approximately 0.017 feet/foot.

The average horizontal velocity, as discussed in Section 5.5.3.5, is on the order of 9 ft/yr. The velocities in the area of MW-1, MW-4 and MW-5 where water bearing layers appear to be thinning are on the order of 4 ft/yr.

The thickness of the water bearing layers underneath the Site vary. The upper sand unit is between 1 and 2 feet in thickness and appears to be continuous throughout the Site. The lower sand unit is approximately 15 feet in thickness in the area immediately northwest of the RCRA impoundment but appears to thin out in a west and northwest direction into two layers that are approximately 1 to 2 feet in thickness and are separated by a silty clay layer.

Movement in a horizontal direction will be relatively slow because of the flat hydraulic gradient, low horizontal velocities and the thinning of the sand layers in the apparent direction of groundwater flow.

5.5.3.8 Future Contamination Movement - Based on the previous and recently collected data primarily non-regulated constituents are migrating from the potential sources. The regulated constituents, which appear to be relatively immobile, are not very well represented within the plume area and when present were detected at relatively minor concentrations. Future contamination movement of the non-regulated constituents such as iron, manganese, zinc and sulfate are expected to proceed at current calculated horizontal velocities in the direction of groundwater flow.

5.5.4 Surface Water and Sediment Contamination

5.5.4.1 General - Ricks Ditch, which is an intermittent irrigation ditch and channel for storm water, is the primary surface water body in the study area. It is located topographically below the potential sources which released contamination. SWMU No. 1 was located immediately adjacent to Ricks Ditch, as shown on Figure 2, and seepage and/or overtopping of the impoundment could have released contaminants directly into the ditch.

Surface water and sediment from Ricks Ditch have been collected and analyzed to determine if it has been contaminated by Syro or other off-site sources. The data is summarized in Table 15. This data indicates that the surface water and sediment in Ricks Ditch have elevated levels of iron, manganese, zinc and sulfate and slightly elevated levels of cadmium, chromium and lead.

5.5.4.2 Extent of Contamination - Surface water, sediment and soil samples collected along Ricks

Ditch west of the SWMUs indicate they have elevated levels of several non-regulated constituents above baseline concentration levels. Ricks Ditch has been cleaned out several times by excavating the sediment and placing it adjacent to the ditch. Samples of dredged sediment from the banks of Ricks Ditch indicate the presence of elevated levels of non-regulated constituents. Surface water sample RCK-6 obtained downgradient across Child Lane indicates that the non-regulated constituents constituent have not migrated that far.

5.5.4.3 Contamination Movement - The surface water in Ricks Ditch flows from south to north. The water flows under Child Lane and to agricultural land to the west northwest of Syro as shown on Figure 9. Therefore, any contaminated surface water is flowing off-site to the west of Syro and eventually flows into the Great Salt Lake.

There is probably little migration of sediment from the ditch, except during high storm runoff events. Some of the sediment may be transported by wind during dry, windy weather conditions.

5.5.4.4 Chemical Composition of Surface Water and Sediment - Table 15 summarizes data on the chemical composition of surface water, sediment and soil samples obtained from Ricks Ditch.

SECTION 6

CONCLUSIONS

Based on information collected as part of the RCRA Facility Investigation (RFI), several regulated and non-regulated inorganic constituents were identified in the soil and groundwater below and adjacent to the SWMUs and the former RCRA impoundment. In addition, a trace of two volatile organic compounds (VOCs) was detected in one groundwater sample.

Some of the regulated constituents identified in the soil and groundwater are above baseline concentration levels and groundwater protection standards; therefore, there is a potential need for corrective measures. Syro proposes to perform a Corrective Measures Study (CMS) to identify and evaluate alternatives for any corrective action necessary to prevent or mitigate any migration or release of regulated wastes or constituents at or from the facility.

The RFI identified cadmium, chromium, lead and selenium above baseline concentration levels in some soil and sludge samples collected from the SWMUs and the former RCRA impoundment. SWMUs No. 1, 2, 3, 4 and 5 all exhibited elevated levels of regulated and non-regulated constituents. The TCLP tests indicated that the regulated inorganic constituents are relatively immobile with only two lead concentrations, 6.9 and 7.5 mg/l, slightly above the TCLP MCL of 5.0 mg/l. Based on the baseline concentration levels for soil and sludge, areas of SWMUs No. 1 and 2, the discharge pipeline (SWMU No. 3), and the former RCRA impoundment (SWMUs No. 4 and 5) may require corrective measures. No evidence of SWMU No. 6 was identified separate from SWMU No. 2.

Some of the groundwater in the shallow aquifer system, identified on Figure 19, will probably require corrective measures. There is evidence that the degree of groundwater contamination has improved over time; however, several regulated constituents are still above groundwater protection levels. The RFI identified the horizontal and vertical extent of the groundwater contamination plume. The contamination plume, based on the indicator parameters of pH, sulfate and specific conductance, has migrated approximately 600 to 700 feet to the northwest in the direction of groundwater flow as shown on Figure 19. The groundwater investigations identified cadmium, lead, nickel and zinc as the only regulated inorganic constituents above EPA MCLs. There is also an indication that chromium is present in the groundwater. Continued sampling and analysis for total chromium will enable Syro to determine if chromium is actually present in the groundwater and at what concentrations. In addition, elevated levels of non-regulated constituents included sulfate, iron, manganese and low pH values which were detected in some groundwater samples from the monitor wells. Tetrachloroethene and trichloroethene were detected in a groundwater sample from

MW-6 at concentrations slightly above MCL and detection limits. These two slightly elevated VOCs do not appear to be significant, however, additional sampling and analysis of MW-6 is proposed to further evaluate the presence of VOCs in the groundwater.

The RFI also identified some elevated concentrations of non-regulated constituents in sediment and surface water samples collected in and adjacent to Ricks Ditch. One sediment sample, RCK-3, and one bank soil sample, RCK-2, detected regulated constituents above baseline concentration levels. In conclusion, Ricks Ditch exhibits elevated levels of primarily non-regulated constituents in the sediment and surface water and the CMS should be performed to evaluate the necessity of corrective measures.

The RFI also investigated six (6) off-site groundwater sampling locations shown on Figure 9 as OS-1 through OS-6. The groundwater samples, which were collected with the HydroPunch, were analyzed in the field for indicator parameters of pH, temperature, specific conductivity and sulfate and the results are reported on Page A-121 of Appendix A. The results indicate no evidence of off-site contamination based on the indicator parameter values.

Based on available data and a review of existing water wells in the general area there is no risk of the existing soil, sludge and groundwater contamination affecting the water quality of the water wells.

SECTION 7

RECOMMENDATIONS

- Syro proposes to perform a Corrective Measures Study (CMS) to determine whether or not appropriate corrective actions are necessary to prevent or mitigate any migration or release of regulated wastes at and adjacent to the facility. The CMS will probably include a Risk Assessment to evaluate risked-based action levels for soil, sludge and groundwater.

- Groundwater sampling and analysis will be performed on a quarterly basis for monitor wells MW-1 through MW-8, and DG-4, to further evaluate groundwater quality and to determine if the concentrations are changing. The groundwater samples from MW-6 will also be analyzed for VOCs to further evaluate the constituents previously reported above the detection limit, tetrachloroethene and trichloroethene.

- Groundwater level measurements should be performed on a quarterly basis in the monitor wells and piezometers to evaluate seasonal fluctuations in the water table.

SECTION 8

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TABLE 1

LABORATORY ANALYTICAL PARAMETERS AND METHODS
SOIL AND SLUDGE SAMPLES

PARAMETERS	EPA METHOD No.	DETECTION LIMITS (mg/kg)	HOLDING TIMES
Metals			
Arsenic	7060	0.5	6 months
Cadmium	6010	0.05	6 months
Chromium	6010	0.5	6 months
Iron	6010	0.5	6 months
Lead	6010	0.5	6 months
Manganese	6010	0.5	6 months
Nickel	6010	0.5	6 months
Selenium	7740	0.1	6 months
Zinc	6010	0.5	6 months
TCLP			
Arsenic	7060	0.5 mg/l	6 months
Cadmium	6010	0.1 mg/l	6 months
Chromium	6010	0.5 mg/l	6 months
Lead	6010	0.1 mg/l	6 months
Selenium	7740	0.1 mg/l	6 months
Other Parameters			
pH (units)	150.1	0.1	NA
Alkalinity	310.2	10	14 days
Sulfate	375.2	5.0	28 days
Sulfide Reactivity	376.1	5.0	NA

TABLE 2

LABORATORY ANALYTICAL PARAMETERS AND METHODS
SOIL SAMPLES

PARAMETERS	EPA METHOD No.	DETECTION LIMITS (mg/kg)	HOLDING TIMES
Metals			
Arsenic	7060	0.5	6 months
Cadmium	6010	0.05	6 months
Chromium	6010	0.5	6 months
Iron	6010	0.5	6 months
Lead	6010	0.5	6 months
Manganese	6010	0.5	6 months
Nickel	6010	0.5	6 months
Selenium	7740	0.1	6 months
Zinc	6010	0.5	6 months
Other Parameters			
pH (units)	150.1	0.1	NA
Sulfate	375.2	5.0	28 days

TABLE 3

LABORATORY ANALYTICAL PARAMETERS AND METHODS SOIL SAMPLES

PARAMETERS	EPA METHOD No.	DETECTION LIMITS (mg/kg)	HOLDING TIMES
Metals			
Arsenic	7060	0.5	6 months
Barium	6010	0.5	6 months
Cadmium	6010	0.05	6 months
Chromium	6010	0.5	6 months
Iron	6010	0.5	6 months
Lead	6010	0.5	6 months
Manganese	6010	0.5	6 months
Nickel	6010	0.5	6 months
Selenium	7740	0.1	6 months
Zinc	6010	0.5	6 months
Other Parameters			
pH (units)	150.1	0.1	NA
Sulfate	375.2	5.0	28 days
Cation Exchange	NA	NA	NA
Organic Content	209 F	NA	NA

TABLE 4

LABORATORY ANALYTICAL PARAMETERS AND METHODS SEDIMENT SAMPLES

PARAMETERS	EPA METHOD No.	DETECTION LIMITS (mg/kg)	HOLDING TIMES
Metals			
Arsenic	7060	0.5	6 months
Barium	6010	0.5	6 months
Cadmium	6010	0.05	6 months
Chromium	6010	0.5	6 months
Iron	6010	0.5	6 months
Lead	6010	0.5	6 months
Manganese	6010	0.5	6 months
Nickel	6010	0.5	6 months
Selenium	7740	0.1	6 months
Zinc	6010	0.5	6 months
TCLP	1311		
Arsenic	7060	0.5 mg/l	6 months
Cadmium	6010	0.1 mg/l	6 months
Chromium	6010	0.5 mg/l	6 months
Lead	6010	0.1 mg/l	6 months
Selenium	7740	0.1 mg/l	6 months
Other Parameters			
pH (units)	150.1	0.1	NA
Acidity	305.2	20	14 days
Alkalinity as $CaCO_3$	310.2	10	14 days
Nitrate	353.2	0.01	14 days
Nitrite	353.2	0.01	14 days
Sulfate	375.2	5.0	28 days
Total Organic Carbon	415.1	1.0	28 days

TABLE 5

LABORATORY ANALYTICAL PARAMETERS AND METHODS
DISCRETE GROUNDWATER SAMPLES
"LIMITED ANALYSES"

PARAMETERS	EPA METHOD No.	DETECTION LIMITS (mg/l)	HOLDING TIMES
Metals			
Arsenic	7060	0.01	6 months
Cadmium	6010	0.005	6 months
Chromium	6010	0.01	6 months
Iron	6010	0.01	6 months
Lead	6010	0.05	6 months
Manganese	6010	0.01	6 months
Nickel	6010	0.010	6 months
Selenium	7740	0.005	6 months
Zinc	6010	0.01	6 months
Other Parameters			
Sulfate	375.2	5.0	28 days
pH (units)	150.1	0.01	NA
Specific Conductance	120.1	10	NA

TABLE 6

LABORATORY ANALYTICAL PARAMETERS AND METHODS GROUNDWATER SAMPLES "TOTAL ANALYSES"

PARAMETERS	EPA METHOD No.	DETECTION LIMITS (mg/l)	HOLDING TIMES
Metals			
Arsenic	7060	0.01	6 months
Cadmium	6010	0.005	6 months
Chromium VI	218.5	0.05	6 months
Iron	6010	0.01	6 months
Lead	7421	0.005	6 months
Nickel	6010	0.010	6 months
Manganese	6010	0.01	6 months
Selenium	7740	0.005	6 months
Zinc	6010	0.01	6 months
Major Ions			
Calcium	6010	1.0	6 months
Magnesium	6010	1.0	6 months
Potassium	6010	1.0	6 months
Sodium	6010	1.0	6 months
Bicarbonate	403.0	10	14 days
Carbonate	403.0	10	14 days
Chloride	325.3	0.5	28 days
Sulfate	375.2	5.0	28 days
Other Parameters			
Alkalinity	310.2	10	28 days
pH (units)	353.2	0.1	NA
Specific Conductance	120.1	10	NA

TABLE 7

LABORATORY ANALYTICAL PARAMETERS AND METHODS SURFACE WATER SAMPLES

PARAMETERS	EPA METHOD No.	DETECTION LIMITS (mg/l)	HOLDING TIMES
Metals			
Cadmium	6010	0.005	6 months
Chromium	6010	0.01	6 months
Iron	6010	0.01	6 months
Lead	6010	0.05	6 months
Manganese	6010	0.01	6 months
Nickel	6010	0.010	6 months
Selenium	7740	0.005	6 months
Zinc	6010	0.01	6 months
Other Parameters			
Acidity	305.2	20	14 days
Alkalinity as $CaCO_3$	310.2	10	14 days
Chemical Oxygen Demand (COD)	410.1	5.0	28 days
Nitrate	353.2	0.01	14 days
pH (units)	150.1	0.1	NA
Specific Conductance	120.1	NA	NA
Sulfate	375.2	5.0	28 days
Total Dissolved Solids (TDS)	160.3	1.0	7 days
Total Suspended Solids (TSS)	160.1	1.0	7 days
Total Organic Carbon (TOC)	415.1	1.0	28 days

TABLE 8

SUMMARY OF GROUNDWATER HORIZONTAL VELOCITY ESTIMATES

Monitor Well ID	Hydraulic Conductivity (cm/sec)	Porosity	Estimated Gradient	Velocity (ft/yr)
MW-1	2.3×10^{-4}	0.33	0.009	6.5
MW-2	1.8×10^{-4}	0.33	0.01	5.6
MW-3	1.7×10^{-4}	0.33	0.02	10.7
MW-4	7.2×10^{-5}	0.33	0.01	2.3
MW-5	5.2×10^{-5}	0.33	0.02	3.3
MW-6	3.5×10^{-4}	0.33	0.02	21.9
DH-41	1.2×10^{-4}	0.33	0.029	10.9
DH-42	6.6×10^{-5}	0.33	0.019	3.9
DH-43	1.3×10^{-4}	0.33	0.013	5.3
DH-45	2.9×10^{-4}	0.33	0.010	9.1
DG-4	2.9×10^{-4}	0.33	0.02	18.2
UG-Well	1.2×10^{-4}	0.33	0.006	2.3
Syro Well	1.3×10^{-4}	0.33	0.03	12.2

N = 13

K : .009 - .03

$\bar{K}$ = 1.66154 x 10^{-2}

Z : 2.3 - 21.5 ft/yr

$\bar{K}$ = 1.24615 x 10^{-2}

TABLE 9

SOLID WASTE MANAGEMENT UNIT NO. 1
SLUDGE ANALYTICAL RESULTS (mg/kg)

Drill Hole No.	Baseline	SM1-DH1	SM1-DH2	SM1-DH3	SM1-DH4	SM1-DH5	SM1-DH6
Sample Depth	Standard	5-5.5'	5-6.3'	4.3-4.8'	4.8-7'	5-7'	3.5-5'
Sample Date	or MCL	6/3/91	6/3/91	6/3/91	6/3/91	6/3/91	6/3/91
TOTAL METALS *	Baseline						
Arsenic	100	1.6	1.7	1.7	2.2	1.4	0.6
Cadmium	0	<0.05	4.8	2.0	0.98	0.44	<0.05
Chromium	85.6	5.6	45	30	4.2	11	1.8
Iron	37,494	2,200	14,000	6,900	440	2,400	1,500
Lead	93	[180]JS	[170]JS	[2,100]JS	[71]JS	[3,600]JS	[59]JS
Manganese	531	49	190	130	8.4	22	12
Nickel	97	<0.5	13	7.3	<0.05	<0.5	0.61
Selenium	0.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc	574	[1,500]JS	[6,500]JS	[3,000]JS	[1,300]JS	[810]JS	[140]JS
TCLP METALS **	MCL						
Arsenic (mg/l)	5.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium (mg/l)	1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium (mg/l)	5.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Lead (mg/l)	5.0	2.7	0.6	6.9	0.3	1.3	<0.1
Selenium (mg/l)	1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
OTHER PARAMETERS	Baseline						
pH (units)	7.2-9.4	8.9	12	12	6.9	7.3	7
Alkalinity as $CaCO_3$		170	3,200	3,200	65	55	30
Sulfate	721	1,100	1,300	1,400	1,000	1,900	190
Sulfide Reactivity		<5.0	<5.0	<5.0	<5.0	<5.0	<5.0

* Prior to analysis samples were prepared by acid digestion as outlined in EPA SW-846 (Third Edition), Method 3050.

** Prior to analysis samples were prepared by the TCLP extraction procedure as outlined in EPA SW-846 (Third Edition), Method 1311.

Shaded areas indicate constituents above baseline standards or TCLP maximum concentration limits.

All units in milligrams per kilogram (mg/kg), dry weight basis, except as noted.

TABLE 9

SOLID WASTE MANAGEMENT UNIT NO. 1
SOIL ANALYTICAL RESULTS (mg/kg)

Drill Hole No.	Baseline	SM1-DH1	SM1-DH2	SM1-DH3	SM1-DH5
Sample Depth	Standard	7'	7'	10'	7'
Sample Date		6/3/91	6/3/91	6/3/91	6/3/91
TOTAL METALS *					
Arsenic	100	41	9.3	7.5	25
Barium		60	85	28	250
Cadmium	0	5.7	6.9	7.0	7.4
Chromium	85.6	60	80	54	46
Iron	37,494	30,000	19,000	18,000	35,000
Lead	93	73	100	[90]JS	120
Manganese	531	180	250	120	380
Nickel	97	32	48	25	34
Selenium	0.0	<0.1	<0.1	<0.1	<0.1
Zinc	574	2,100	2,200	[910]JS	2,600
OTHER PARAMETERS					
pH (units)	7.2-9.4	3.9	4.8	5.9	4.0
% Organics		0.47	0.19	6.8	0.32
Sulfate	721	3,800	2,400	240	4,500
Cation Exchange Capacity		170	210	47	580

* Prior to analysis samples were prepared by acid digestion as outlined in EPA SW-846 (Third Edition), Method 3050.

Shaded areas indicate constituents above baseline standards.

All units in milligrams per kilogram (mg/kg), dry weight basis, except as noted.

TABLE 9

SOLID WASTE MANAGEMENT UNIT NO.1
SLUDGE AND SOIL ANALYTICAL RESULTS (mg/kg)

Test Pit I.D. No.	Baseline	TP-SM1-1		TP-SM1-2		TP-SM1-3		TP-SM1-4	
Location	Standard	Inside	Outside	Inside	Outside	Inside	Outside	Inside	Outside
Sample Depth	or MCL	5'	5'	5'	5'	5'	5'	5'	5'
Sample Date		6/3/91	6/3/91	6/4/91	6/4/91	6/4/91	6/4/91	6/4/91	6/4/91
TOTAL METALS *	Baseline								
Arsenic	100	2.1	5.0	3.5	1.2	1.3	2.0	1.8	3.0
Cadmium	0	<0.05	4.5	2.8	2.3	6.4	2.0	<0.05	5.4
Chromium	85.6	3.6	100	22	27	31	15	25	130
Iron	37,494	1,100	29,000	12,000	14,000	33,000	12,000	560	24,000
Lead	93	[100]JS	[47]JS	94	37	250	33	160	76
Manganese	531	8.4	110	330	98	1,400	110	14	230
Nickel	97	<0.5	14	16	14	19	12	0.6	21
Selenium	0.0	<0.1	<0.1	0.3	<0.1	<0.1	<0.1	<0.1	0.1
Zinc	574	[310]JS	[570]JS	580	85	11,000	560	250	3,700
TCLP METALS **	MCL								
Arsenic	5.0	<0.5	NA	<0.5	NA	<0.5	NA	<0.5	NA
Cadmium	1.0	<0.1	NA	<0.1	NA	<0.1	NA	<0.1	NA
Chromium	5.0	<0.5	NA	<0.5	NA	<0.5	NA	<0.5	NA
Lead	5.0	0.2	NA	<0.1	NA	<0.1	NA	<0.1	NA
Selenium	1.0	<0.1	NA	<0.1	NA	<0.1	NA	<0.1	NA
OTHER PARAMETERS	Baseline								
pH (units)	7.2-9.4	7.2	7.7	7.8	7.5	7.8	7.8	7.5	8.1
Alkalinity as $CaCO_3$		45	NA	[110]JS	NA	[130]JS	NA	[43]JS	NA
Sulfate	721	1,300	110	1,300	30	1,600	450	340	110
Sulfide Reactivity		<5.0	NA	<5.0	NA	26	NA	<5.0	NA

* Prior to analysis samples were prepared by acid digestion as outlined in EPA SW-846 (Third Edition), Method 3050.

** Prior to analysis samples were prepared by the TCLP extraction procedure as outlined in EPA SW-846 (Third Edition), Method 1311.

NA Not Analyzed

Shaded areas indicate constituents above baseline standards or TCLP maximum concentration limits.

All units in milligrams per kilogram (mg/kg), dry weight basis, except as noted.

TABLE 10

SOLID WASTE MANAGEMENT UNIT NO. 2
SLUDGE ANALYTICAL RESULTS (mg/kg)

Drill Hole No.	Baseline	SM2-DH1	SM2-DH2	SM2-DH3	SM2-DH6
Sample Depth	Standard	5.4-7.9'	6.5-8.5'	7.6-8.6'	6.3-7'
Sample Date	or MCL	6/4/91	6/3/91	6/4/91	6/5/91
TOTAL METALS *	Baseline				
Arsenic	100	1.0	1.2	1.2	0.8
Cadmium	0	3.3	7.5	28	3.3
Chromium	85.6	21	36	140	20
Iron	37,494	14,000	15,000	56,000	4,700
Lead	93	37	[610]JS	1,700	1,100
Manganese	531	64	100	140	36
Nickel	97	7.9	13	19	3.3
Selenium	0.0	<0.1	<0.1	0.2	0.2
Zinc	574	1,600	[14,000]JS	47,000	6,900
TCLP METALS **	MCL				
Arsenic	5.0	<0.5	<0.5	<0.5	<0.5
Cadmium	1.0	<0.1	0.5	<0.1	<0.1
Chromium	5.0	<0.5	[0.4]R	<0.5	<0.5
Lead	5.0	<0.1	7.5	<0.1	0.5
Selenium	1.0	<0.1	<0.1	<0.1	<0.1
OTHER PARAMETERS	Baseline				
pH (units)	7.2-9.4	5.3	11	7.3	6.9
Alkalinity as $CaCO_3$		[3.6]JS	170	[140]JS	[55]JS
Sulfate	721	2,300	1,500	1,600	2,800
Sulfide Reactivity		<5.0	<5.0	<5.0	<5.0

* Prior to analysis samples were prepared by acid digestion as outlined in EPA SW-846 (Third Edition), Method 3050.

** Prior to analysis samples were prepared by the TCLP extraction procedure as outlined in EPA SW-846 (Third Edition), Method 1311.

Shaded areas indicate constituents above baseline standards or TCLP maximum concentration limits.

All units in milligrams per kilogram (mg/kg), dry weight basis, except as noted.

TABLE 10

SOLID WASTE MANAGEMENT UNIT NO. 2
SOIL ANALYTICAL RESULTS (mg/kg)

Drill Hole No.	Baseline	SM2-DH2	SM2-DH3	SM2-DH4	SM2-DH6
Sample Depth	Standard	10-10.5	9.5	9.6	9.5
Sample Date		6/3/91	6/4/91	6/4/91	6/5/91
TOTAL METALS *					
Arsenic	100	24	1.9	2.4	6.2
Barium		87	53	87	190
Cadmium	0	7.3	3.3	2.3	5.5
Chromium	85.6	61	75	25	160
Iron	37,494	36,000	21,000	18,000	37,000
Lead	93	[100]JS	46	49	74
Manganese	531	260	130	40	160
Nickel	97	39	20	4.8	18
Selenium	0.0	<0.1	<0.1	<0.1	<0.1
Zinc	574	[2,400]JS	860	450	1,100
OTHER CHEMISTRIES					
pH (units)	7.2-9.4	7.6	3.6	5.5	4.1
% Organics		14	0.17	0.29	0.23
Sulfate	721	1,400	2,950	1,900	2,500
Cation Exchange Capacity		94	84	450	450

* Prior to analysis samples were prepared by acid digestion as outlined in EPA SW-846 (Third Edition), Method 3050.

Shaded areas indicate constituents above baseline standards.

All units in milligrams per kilogram (mg/kg), dry weight basis, except as noted.

TABLE 10

SOLID WASTE MANAGEMENT UNIT NO. 2
SLUDGE AND SOIL ANALYTICAL RESUTLS (mg/kg)

Test Pit I.D. No.	Baseline	TP-SM2-1		TP-SM2-2		TP-SM2-3		TP-SM2-4	
Location	Standard	Inside	Outside	Inside	Outside	Inside	Outside	Inside	Outside
Sample Depth	or MCL	5'	5'	5'	5'	5'	5'	5'	5'
Sample Date		6/4/91	6/4/91	6/10/91	6/10/91	6/4/91	6/4/91	6/10/91	6/10/91
TOTAL METALS *	Baseline								
Arsenic	100	2.1	3.1	1.5	5.4	2.9	3.7	0.5	<0.5
Cadmium	0	6.7	3.1	4.3	5.5	31	3.0	35	2.0
Chromium	85.6	20	28	92	46	86	25	130	24
Iron	37,494	6500	23,000	9,000	17,000	6,900	16,000	41,000	1,700
Lead	93	130	110	210	120	7,800	54	19,000	63
Manganese	531	120	340	22	271	79	380	180	23
Nickel	97	11	17	7.8	21	7.7	19	43	5.6
Selenium	0.0	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.1
Zinc	574	3,200	1,200	3,800	2,000	7,500	63	41,000	300
TCLP METALS **	MCL								
Arsenic	5.0	<0.5	NA	<0.5	NA	<0.5	NA	<0.5	NA
Cadmium	1.0	<0.1	NA	<0.1	NA	<0.1	NA	<0.1	NA
Chromium	5.0	<0.5	NA	<0.5	NA	<0.5	NA	<0.5	NA
Lead	5.0	<0.1	NA	<0.1	NA	0.4	NA	<0.1	NA
Selenium	1.0	<0.1	NA	<0.1	NA	<0.1	NA	<0.1	NA
OTHER PARAMETERS	Baseline								
pH (units)	7.2-9.4	7.6	7.5	7.2	7.4	7.5	7.6	6.8	7.0
Alkalinity as $CaCO_3$		[100]JS	NA	14.1	NA	[65]JS	NA	600	NA
Sulfate	721	2,100	2,100	4,100	1,700	1,900	240	1,400	1,700
Sulfide Reactivity		<5.0	NA	<5.0	NA	<5.0	NA	<5.0	NA

* Prior to analysis samples were prepared by acid digestion as outlined in EPA SW-846 (Third Edition), Method 3050.
** Prior to analysis samples were prepared by the TCLP extraction procedure as outlined in EPA SW-846 (Third Edition), Method 1311.
NA Not Analyzed
Shaded areas indicate constituents above baseline standards or TCLP maximum concentration limits.
All units in milligram per kilogram (mg/kg), dry weight basis, except as noted.

TABLE 11

SOLID WASTE MANAGEMENT UNIT NO.3
SOIL ANALYTICAL RESULTS (mg/kg)

Drill Hole I.D. No.	Baseline	TP-SM3-1	TP-SM3-5		TP-SM3-6	
Sample Depth	Standard	4.5'	3'	3'	3'	3'
Sample Date	or MCL	7/26/91	4/19/94	4/19/94	4/19/94	4/19/94
TOTAL METALS *	Baseline					
Arsenic	100	3.6	5.7	1.5	2.4	2.7
Cadmium	0	9.5	2.2	1.8	0.8	1.1
Chromium	85.6	42	38	37	17	20
Iron	37,494	15000	29000	25000	14000	15000
Lead	93	350	59	18	6.5	10
Manganese	531	220	690	300	120	200
Nickel	97	96	32	26	14	16
Selenium	0	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc	574	11000	66	61	69	360
TCLP METALS **	MCL					
Arsenic (mg/l)	5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium (mg/l)	1	<0.1	<0.03	<0.03	<0.03	<0.03
Chromium (mg/l)	5	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (mg/l)	5	<0.1	<0.005	<0.005	<0.005	<0.005
Selenium (mg/l)	1	<0.1	<0.1	<0.1	<0.1	<0.1
OTHER PARAMETERS	Baseline					
pH (units)	7.2-9.4	6.6	6.8	6.5	7.1	7
Alkalinity as $CaCO_3$		100	41	18	36	64
Sulfate	721	2200	80	90	<5.0	<5.0
Sulfide Reactivity		<5.0	<5.0	<5.0	58	22

* Prior to analysis samples were prepared by acid digestion as outlined in EPA SW-846 (Third Edition), Method 3050.

** Prior to analysis samples were prepared by the TCLP extraction procedure as outlined in EPA SW-846 (Third Edition), Method 1311.

Shaded areas indicate constituents above baseline standards or TCLP maximum concentration limits.

All units in milligrams per kilogram (mg/kg), dry weight basis, except as noted.

TABLE 11

SOLID WASTE MANAGEMENT UNIT NO.3
SOIL ANALYTICAL RESULTS (mg/kg)

Drill Hole I.D. No.	Baseline	TP-SM3-7		TP-SM3-6
Sample Depth	Standard	2.8'	2.8'	Pipe Sludge
Sample Date	or MCL	4/19/94	4/19/94	4/19/94
TOTAL METALS *	Baseline			
Arsenic	100	2.4	1.9	5.4
Cadmium	0	1.6	1.8	1.5
Chromium	85.6	35	36	50
Iron	37,494	23000	24000	4000
Lead	93	17	15	18000
Manganese	531	340	200	46
Nickel	97	25	25	5.7
Selenium	0	<0.1	<0.1	0.7
Zinc	574	470	220	720
TCLP METALS **	MCL			
Arsenic (mg/l)	5	<0.5	<0.5	<0.5
Cadmium (mg/l)	1	<0.03	<0.03	<0.03
Chromium (mg/l)	5	<0.05	<0.05	<0.05
Lead (mg/l)	5	0.006	<0.005	8.1
Selenium (mg/l)	1	<0.1	<0.1	<0.1
OTHER PARAMETERS	Baseline			
pH (units)	7.2-9.4	6.4	6.6	7.4
Alkalinity as $CaCO_3$		18	18	190
Sulfate	721	<5.0	<5.0	51
Sulfide Reactivity		79	48	210

* Prior to analysis samples were prepared by acid digestion as outlined in EPA SW-846 (Third Edition), Method 3050.

** Prior to analysis samples were prepared by the TCLP extraction procedure as outlined in EPA SW-846 (Third Edition), Method 1311.

Shaded areas indicate constituents above baseline standards or TCLP maximum concentration limits.

All units in milligrams per kilogram (mg/kg), dry weight basis, except as noted.

TABLE 12

SOLID WASTE MANAGEMENT UNIT NO. 4
SOIL ANALYTICAL RESULTS (mg/kg)

Sample I.D. No.	Baseline	RCI-1	RCI-2	RCI-3	RCI-4	RCI-5	RCI-6
Sample Depth	Standard	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'
Sample Date	or MCL	6/7/91	6/7/91	6/7/91	6/7/91	6/7/91	6/7/91
TOTAL METALS *	Baseline						
Arsenic	100	4.3	6.9	4.9	5.8	6.1	7.1
Barium		43	52	58	60	70	59
Cadmium	0	9.0	9.3	11	9.6	10	19
Chromium	85.6	52	76	63	59	53	63
Iron	37,494	24,000	31,000	38,000	30,000	38,000	49,000
Lead	93	320	160	410	290	120	140
Manganese	531	210	280	190	280	650	750
Nickel	97	28	43	25	29	45	47
Selenium	0.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc	574	17,000	25,000	10,000	19,000	43,000	39,000
TCLP METALS **	MCL						
Arsenic	5.0	NA	NA	<0.5	NA	NA	NA
Cadmium	1.0	NA	NA	<0.1	NA	NA	NA
Chromium	5.0	NA	NA	<0.5	NA	NA	NA
Lead	5.0	NA	NA	<0.3	NA	NA	NA
Selenium	1.0	NA	NA	<0.1	NA	NA	NA
OTHER PARAMETERS	Baseline						
pH (units)	7.2-9.4	7.2	7.0	7.5	7.6	7.7	7.8
% Organics		0.38	0.45	0.54	0.39	0.74	0.77
Sulfate	721	1,900	1,800	1,500	1,700	1,800	1,700
Cation Exchange Capacity		110	150	150	120	100	120

* Prior to analysis samples were prepared by acid digestion as outlined in EPA SW-846 (Third Edition), Method 3050.

** Prior to analysis samples were prepared by the TCLP extraction procedure as outlined in EPA SW-846 (Third Edition), Method 1311

NA Not Analyzed

Shaded areas indicate constituents above baseline standards or TCLP maximum concentration limits.

All units in milligrams per kilogram (mg/kg), dry weight basis, except as noted.

TABLE 12

SOLID WASTE MANAGEMENT UNIT NO. 4
SOIL ANALYTICAL RESULTS (mg/kg)

Sample I.D. No.	Baseline	RCI-7	RCL-8	RCL-9	RCL-10	RCL-11	RCL-12
Sample Depth	Standard	0-1'	0-1'	0-1'	0-1'	2-3'	2-3'
Sample Date		6/7/91	6/7/91	6/7/91	6/11/91	6/11/91	6/11/91
TOTAL METALS *							
Arsenic	100	5.1	2.3	4.0	1.0	3.4	<0.5
Barium		49	NA	NA	NA	45	67
Cadmium	0	8.7	1.1	1.6	4.0	6.9	2.0
Chromium	85.6	98	12	16	35	77	26
Iron	37,494	33,000	9,400	1,100	11,000	18,000	5,200
Lead	93	310	24	40	73	110	61
Manganese	531	100	300	250	110	210	52
Nickel	97	20	11	13	16	29	5.9
Selenium	0.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc	574	21,000	960	910	210	10,000	540
OTHER PARAMETERS							
pH (units)	7.2-9.4	6.7	7.1	7.6	7.9	6.5	6.5
% Organics		0.36	NA	NA	NA	0.11	0.07
Sulfate	721	1,500	2,600	475	95	1,900	1,700
Cation Exchange Capacity		170	NA	NA	NA	81	35

* Prior to analysis samples were prepared by acid digestion as outlined in EPA SW-846 (Third Edition), Method 3050.

NA Not Analyzed

Shaded areas indicate constituents above baseline standards.

All units in milligrams per kilogram (mg/kg), dry weight basis, except as noted.

TABLE 13

SOLID WASTE MANAGEMENT UNIT NO. 5
STOCKPILE COMPOSITE SOIL ANALYTICAL RESULTS (mg/kg)

Sample I.D. No.	Baseline	SSP-1	SSP-2	SSP-3	SSP-4	SSP-5	SSP-6
	Standard or MCL	6/7/91	6/7/91	6/7/91	6/7/91	6/7/91	6/7/91
TOTAL METALS *	Baseline						
Arsenic	100	4.6	7	5.1	4.2	6.2	2.6
Cadmium	0	6.2	7.7	8.6	10	9.5	9.1
Chromium	85.6	51	58	62	66	59	70
Iron	37,494	18,000	23,000	23,000	27,000	25,000	31,000
Lead	93	710	260	300	380	300	750
Manganese	531	210	250	250	280	290	89
Nickel	97	21	27	25	28	27	19
Selenium	0.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc	574	6,800	8,100	16,000	19,000	19,000	5,000
TCLP METALS **	MCL						
Arsenic	5.0	<0.5	NA	NA	NA	NA	<0.5
Cadmium	1.0	<0.1	NA	NA	NA	NA	<0.1
Chromium	5.0	<0.5	NA	NA	NA	NA	<0.5
Lead	5.0	<0.1	NA	NA	NA	NA	<0.1
Selenium	1.0	<0.1	NA	NA	NA	NA	<0.1
OTHER PARAMETERS	Baseline						
pH (units)	7.2-9.4	7.3	7.4	7.4	7.4	7.5	6.2
Alkalinity		40	60	60	43	54	54
Sulfate	721	1,900	2,900	2,200	2,500	2,200	2,500
Sulfide	2.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0

* Prior to analysis samples were prepared by acid digestion as outlined in EPA SW-846 (Third Edition), Method 3050.

** Prior to analysis samples were prepared by the TCLP extraction procedure as outlined in EPA SW-846 (Third Edition), Method 1311.

NA Not Analyzed

Shaded areas indicate constituents above baseline standards or TCLP maximum concentration limits.

All units in milligrams per kilogram (mg/kg), dry weight basis, except as noted.

TABLE 13

SOLID WASTE MANAGEMENT UNIT NO. 5
NATURAL SOIL ANALYTICAL RESULTS (mg/kg)

Sample I.D. No.	Baseline	SM5-1	SM5-2	SM5-3
Sample Date	Standard	6/10/91	6/10/91	6/10/91
TOTAL METALS*				
Arsenic	100	3.6	3.3	4.7
Barium		82	90	110
Cadmium	0	4.8	3.4	4.0
Chromium	85.6	39	23	22
Iron	37,494	26,000	22,000	26,000
Lead	93	65	53	64
Manganese	531	380	120	160
Nickel	97	29	17	17
Selenium	0.0	<0.1	<0.1	<0.1
Zinc	574	3,100	1,900	3,800
OTHER PARAMETERS				
pH (units)	7.2-9.4	5.9	4.2	5.5
% Organics		0.75	0.92	1.8
Sulfate	721	2,300	2,300	2,000
Cation Exchange Capacity		390	520	460

* Prior to analysis samples were prepared by acid digestion as outlined in EPA SW-846 (Third Edition), Method 3050.

Shaded areas indicate constituents above baseline standards.

All units in milligrams per kilogram (mg/kg), dry weight basis, except as noted.

TABLE 14

BACKGROUND SOIL ANALYTICAL RESULTS
(mg/kg)

Grid I.D. No.	H1						H9		
Sample Number	H1-1		H1-2		H1-3		H9-1	H9-2	H9-3
Sample Depth (ft)	1.3-2.3	2.9-3.9	1.6-2.6	3.1-4.1	1.9-2.9	3.5-4.5	1.2-2.2	0.5-1.5	1.0-2.0
Arsenic	5.5	6.7	7.5	7.9	11	5.0	24	16	8.8
Cadmium	5.2	<0.05	6.0	<0.05	3.1	<0.05	<0.05	<0.05	<0.05
Chromium	36	30	41	29	20	23	57	45	54
Iron	16,000	13,000	18,000	11,000	21,000	5,700	20,000	15,000	9,500
Lead	200	80	310	61	110	80	51	39	38
Manganese	520	420	610	330	230	290	420	300	410
Nickel	13	48	18	41	24	35	74	56	70
Selenium	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc	110	89	130	220	62	100	100	89	87
pH (units)	8.0	8.3	8.3	8.2	7.9	8.2	8.8	8.5	9.4
Sulfate	110	120	160	80	120	80	20	280	26

All samples collected on April 16, 1991.
All units in milligram per kilogram (mg/kg), dry weight basis, except as noted.

TABLE 15

RICKS DITCH
SURFACE WATER ANALYTICAL RESULTS (mg/l)

Sample I.D.	EPA	RCK-1	RCK-3	RCK-5	RCK-6
Sample Date	DWS	6/10/91	6/10/91	6/10/91	6/10/91
TOTAL METALS *					
Cadmium	0.010	<0.005	<0.005	<0.005	<0.005
Chromium	0.05	<0.01	<0.01	0.03	<0.01
Iron	0.30	1.5	33	32	1.5
Lead	0.05	<0.05	<0.05	0.41	<0.05
Manganese	0.05	1.3	1.8	1.6	0.16
Nickel		0.01	<0.010	0.01	<0.010
Selenium	0.01	<0.005	<0.005	<0.005	<0.005
Zinc	5.0	5.5	<0.01	11	0.54
OTHER PARAMETERS					
Acidity		[10]R	36	[12]R	<20
Alkalinity		<10	130	350	330
COD		25	17	57	12
Nitrate		3.6	<0.01	3.9	<0.01
pH (units)		7.2	6.9	7.8	8.1
Conductivity		1,000	2,300	1,100	1,100
Sulfate	250	430	1,030	108	98
TDS	500	1,500	2,000	630	1,200
TOC		82	82	100	77
TSS		<1.0	<1.0	1.6	<1.0

* EPA, Test Methods for Evaluating Solid Waste: SW-846, Third Edition.
EPA DWS, EPA Primary and Secondary Drinking Water Standard.
Shaded areas indicate constituents above EPA Drinking Water Standards.

TABLE 15

RICKS DITCH
SEDIMENT ANALYTICAL RESULTS (mg/kg)

Sample I.D.	Baseline	RCK-1	RCK-2	RCK-3	RCK-4
Sample Date	Standard or MCL	6/10/91	6/10/91	6/10/91	6/10/91
TOTAL METALS *	Baseline				
Arsenic	100	4.0	2.4	3.7	6.1
Barium		110	58	55	54
Cadmium	0	3.8	8.3	9.8	7.8
Chromium	85.6	30	27	21	19
Iron	37,494	29,000	69,000	89,000	44,000
Lead	93	73	74	80	75
Manganese	531	620	170	200	110
Nickel	97	24	19	18	13
Selenium	0.0	<0.1	<0.1	<0.1	<0.1
Zinc	574	3,000	8,300	13,000	6,700
TCLP METALS **	MCL				
Arsenic	5.0	<0.5	<0.5	<0.5	<0.5
Cadmium	1.0	<0.1	<0.1	<0.1	<0.1
Chromium	5.0	<0.5	<0.5	<0.5	<0.5
Lead	5.0	<0.1	<0.1	<0.1	<0.1
Selenium	1.0	<0.1	<0.1	<0.1	<0.1
OTHER PARAMETERS	Baseline				
Acidity		[12]R	88	180	96
Alkalinity		260	95	85	115
Nitrate		<0.01	<0.01	<0.01	<0.01
Nitrite		<0.01	<0.01	<0.01	<0.01
pH (units)	7.2-9.4	7.2	6.9	6.7	6.5
Sulfate	721	3	1,100	1,200	600
TOC		130	460	110	40

* Prior to analysis samples were prepared by acid digestion as outlined in EPA SW-846 (Third Edition), Method 3050.

** Prior to analysis samples were prepared by the TCLP extraction procedure as outlined in EPA SW-846 (Third Edition) , Method 1311.

Shaded areas indicate constituents above baseline standards or TCLP maximum concentration limits.

TABLE 15

RICKS DITCH
BANK SOIL SAMPLE ANALYTICAL RESUTLS (mg/kg)

Sample I.D.	Baseline	RCK-2	RCK-4
Sample Date	Standard or MCL	6/10/91	6/10/91
TOTAL METALS *	Baseline		
Arsenic	100	3.1	3.5
Barium		71	130
Cadmium	0	6.1	3.5
Chromium	85.6	90	38
Iron	37,494	45,000	20,000
Lead	93	69	59
Manganese	531	120	430
Nickel	97	19	14
Selenium	0.0	<0.1	<0.1
Zinc	574	1,900	2,200
TCLP METALS **	MCL		
Arsenic	5.0	<0.5	<0.5
Cadmium	1.0	<0.1	<0.1
Chromium	5.0	<0.5	<0.5
Lead	5.0	<0.1	<0.1
Selenium	1.0	<0.1	<0.1
OTHER PARAMETERS	Baseline		
Acidity		200	NA
Alkalinity		<10	690
Nitrate		5.0	<0.01
Nitrite		<0.01	<0.01
pH (units)	7.2-9.4	4.0	7.9
Sulfate	721	1,800	NA
TOC		240	NA

* Prior to analysis samples were prepared by acid digestion as outlined in EPA SW-846 (Third Edition), Method 3050.

** Prior to analysis samples were prepared by the TCLP extraction procedure as outlined in EPA SW-846 (Third Edition) , Method 1311.

NA Not Analyzed

Shaded areas indicate constituents above baseline standards or TCLP maximum concentrtation limits.

TABLE 16

HYDROPUNCH GROUNDWATER SAMPLES
FIELD ANALYSIS VS. LABORATORY ANALYSIS (mg/l)

Drill Hole No.	DH-1		DH-2		DH-15		DH-16	
Sample Depth	8-9'		26.5'- 27.5'		5'		2.5'	
Analysis	Field	Lab	Field	Lab	Field	Lab	Field	Lab
INDICATOR PARAMETERS								
Conductivity	3,168	4,000	8,428	10,000	1,340	1,600	1,022	1,200
pH (units)	6.5	7.0	5.2	5.5	5.9	7.0	7.2	7.5
Sulfate	1,600	1,600	13,710	11,000	618	550	72	78

TABLE 17

HYDROPUNCH GROUNDWATER SAMPLE ANALYSIS
FILTERED vs. UNFILTERED ANALYTICAL RESULTS (mg/l)

Sample I.D. No.	EPA	DH-39		DH-40		DH-45	
	MCLs	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered
Sample Date		6/14/91	6/14/91	6/14/91	6/14/91	6/27/91	6/27/91
METALS							
Arsenic	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	0.08
Cadmium	0.005	0.14	0.20	0.13	0.15	<0.005	<0.005
Chromium	0.1	1.2	1.3	1.0	1.0	0.04	0.01
Iron	0.3	550	860	430	670	19	22
Lead	0.015	1.6	1.6	1.1	1.3	<0.05	<0.05
Manganese	0.05	12	13	11	11	13	12
Nickel	0.1	0.30	0.31	0.31	0.35	0.13	0.10
Selenium	0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	5.0	190	*240	190	380	4.6	11
INDICATOR PARAMETERS							
Specific Conductivity			11,000		9,800		5,600
pH (units)			6.1		6.0		6.6
Sulfate	250		6,900		6,100		3,100

Shaded areas indicate constituents above EPA MCLs (Maximum Contaminant Levels).

TABLE 18

HYDROPUNCH GROUNDWATER SAMPLE
ANALYTICAL RESULTS (mg/l)

Sample I.D. No.	EPA	DH-17		DH-32	DH-49	DH-51
Sample Depth	MCLs	5'	8-9'	5'	9.9-10.5'	4'
Sample Date		6/6/91	6/6/91	6/7/91	11/15/91	11/15/91
TOTAL METALS						
Arsenic	0.05	<0.01	<0.01	<0.01	0.006	<0.001
Cadmium	0.005	<0.005	<0.005	<0.005	<0.002	0.013
Chromium	0.1	<0.01	<0.01	<0.01	0.01	0.02
Iron	0.3	0.02	0.68	0.41	0.33	NA
Lead	0.015	<0.05	<0.05	<0.05	<0.05	0.009
Manganese	0.05	1.1	0.97	0.04	1.9	NA
Nickel	0.1	<0.010	<0.010	<0.010	0.02	0.02
Selenium	0.05	<0.005	<0.005	<0.005	<0.002	<0.005
Zinc	5	<0.01	<0.01	<0.01	0.032	0.07
INDICATOR PARAMETERS						
Specific Conductivity		2100	1800	1.6	1800	1800
pH (units)		7.2	7.5	7.5	7	7.2
Sulfate	250	380	330	380	430	590

NA Not Analyzed
Shaded areas indicate constituents above EPA MCLs (Maximum Contaminant Levels).

TABLE 19

SUMMARY OF WATER QUALITY DATA

Syro Compliance Monitor Wells

(in mg/l unless noted otherwise)

Well Identification: MW-1

PARAMETERS	EPA MCLs	SAMPLING DATE			
		12-4-91	5-10-94	8-9-94	11-9-94
DISSOLVED METALS					
Arsenic	0.05	<0.01	<0.005	<0.005	<0.005
Cadmium	0.005	<0.005	<0.004	0.005	<0.004
Chromium	0.1	NA	<0.01	0.02	<0.01
Iron	0.3	0.32	3.1	2.6	3.2
Lead	0.015	0.012	<0.005	<0.005	<0.005
Manganese	0.05	4.5	NA	NA	NA
Nickel	0.1	<0.01	<0.005	0.062	0.044
Selenium	0.05	<0.005	<0.005	<0.005	<0.005
Zinc	5	0.06	0.028	0.088	0.056
ANIONS					
Bicarbonate		530	570	590	560
Carbonate		<10	<10	<10	<10
Chloride		270	320	350	310
Sulfate	250	1600	2500	2900	2300
CATIONS					
Calcium		520	710	790	750
Magnesium		180	240	260	240
Potassium		45	5.5	9.7	11
Sodium		340	420	480	440
OTHER CHEMISTRIES					
Alkalinity		530	NA	NA	NA
Chromium VI		0.064	NA	NA	NA
Total Dissolved Solids		NA	4300	4500	4100
Conductivity (umhos/cm)		3900	5600	5200	3900
pH (units)	6.5-8.5	7.2	7	7.6	6.6
TOC		6.2	NA	NA	NA
TOX		0.014	NA	NA	NA
VOLATILE ORGANICS					
Benzene	5	<2.0	NA	NA	NA
Carbon tetrachloride	5	<2.0	NA	NA	NA
Chloroform		<2.0	NA	NA	NA
trans 1,2-Dichloroethene		<2.0	NA	NA	NA
Tetrachloroethene	5	<2.0	NA	NA	NA
Toluene		<2.0	NA	NA	NA
Trichloroethene	5	<2.0	NA	NA	NA
SEMIVOLATILE ORGANICS					
2-Chlorophenol		<4.0	NA	NA	NA
4-Nitrophenol		<10	NA	NA	NA
4-Chloro-3-methelphenol		<4.0	NA	NA	NA
Pentachlorophenol		<10 JS	NA	NA	NA
Phenol		<4.0	NA	NA	NA
Benzo(a)pyrene		<4.0	NA	NA	NA
Butylbenzyl phthalate		<4.0	NA	NA	NA
Chrysene		<4.0	NA	NA	NA
Diethyl phthalate		<4.0	NA	NA	NA
Deimethyl phythalate		<4.0	NA	NA	NA
Flouranthene		<4.0	NA	NA	NA
Pyrene		<4.0	NA	NA	NA

NA Not Analyzed

Shaded areas indicate values above EPA MCLs (Maximum Contaminant Levels).

TABLE 19

SUMMARY OF WATER QUALITY DATA

Syro Compliance Monitor Wells

(in mg/l unless noted otherwise)

Well Identification: MW-2

PARAMETERS	EPA MCLs	SAMPLING DATE			
		12-4-91	5-10-94	8-9-94	11-9-94
DISSOLVED METALS					
Arsenic	0.05	<0.01	<0.005	<0.005	<0.005
Cadmium	0.005	0.037	0.071	0.059	0.052
Chromium	0.1	NA	<0.01	0.04	<0.01
Iron	0.3	89	280	310	340
Lead	0.015	0.04	<0.005	<0.005	<0.005
Manganese	0.05	46	NA	NA	NA
Nickel	0.1	0.02	0.021	0.11	0.10
Selenium	0.05	<0.005	<0.005	<0.005	<0.005
Zinc	5	0.06	0.051	0.096	0.089
ANIONS					
Bicarbonate		1600	1100	1100	1100
Carbonate		<10	<10	<10	<10
Chloride		1200	<0.5 R	520	450
Sulfate	250	9700	5000	6100	5500
CATIONS					
Calcium		710	720	790	780
Magnesium		2100	1100	1200	1100
Potassium		45	52	39	40
Sodium		1100	580	620	610
OTHER CHEMISTRIES					
Alkalinity		1600	NA	NA	NA
Chromium VI		0.085	NA	NA	NA
Total Dissolved Solids		NA	6200	9300	9700
Conductivity (umhos/cm)		13000	8900	8000	6300
pH (units)	6.5-8.5	6.6	6.9	7.1	6.9

NA Not Analyzed

Shaded areas indicate values above EPA MCLs (Maximum Contaminant Levels).

TABLE 19

SUMMARY OF WATER QUALITY DATA

Syro Compliance Monitor Wells

(in mg/l unless noted otherwise)

Well Identification: MW-3

PARAMETERS	EPA MCLs	SAMPLING DATE			
		12-4-91	5-11-94	8-9-94	11-9-94
DISSOLVED METALS					
Arsenic	0.05	<0.01	<0.005	<0.005	<0.005
Cadmium	0.005	<0.005	<0.004	<0.004	<0.004
Chromium	0.1	NA	<0.01	<0.01	<0.01
Iron	0.3	0.22	3.3	3.8	3.4
Lead	0.015	0.015	0.008	<0.005	<0.005
Manganese	0.05	5.8	NA	NA	NA
Nickel	0.1	<0.01	<0.005	0.01	0.008
Selenium	0.05	<0.005	<0.005	<0.005	<0.005
Zinc	5	0.09	0.095	0.045	0.044
ANIONS					
Bicarbonate		290	240	300	320
Carbonate		<10	<10	<10	<10
Chloride		200	130	150	140
Sulfate	250	850	830	700	630
CATIONS					
Calcium		320	290	270	270
Magnesium		94	79	74	72
Potassium		9.3	5.2	7.3	6.6
Sodium		140	120	140	140
OTHER CHEMISTRIES					
Alkalinity		290	NA	NA	NA
Chromium VI		0.15	NA	NA	NA
Total Dissolved Solids		NA	1500	1400	1500
Conductivity (umhos/cm)		2300	2100	1900	1800
pH (units)	6.5-8.5	7.2	7.3	7.3	6.7

NA Not Analyzed

Shaded areas indicate values above EPA MCLs (Maximum Contaminant Levels).

TABLE 19

SUMMARY OF WATER QUALITY DATA

Syro Compliance Monitor Wells

(in mg/l unless noted otherwise)

Well Identification: MW-4

PARAMETERS	EPA MCLs	SAMPLING DATE			
		12-4-91	5-11-94	8-9-94	11-9-94
DISSOLVED METALS					
Arsenic	0.05	<0.01	<0.005	<0.005	0.011
Cadmium	0.005	<0.005	<0.004	<0.004	<0.004
Chromium	0.1	NA	<0.01	<0.01	<0.01
Iron	0.3	0.05	1.7	0.76	2.2
Lead	0.015	0.014	0.006	<0.005	<0.005
Manganese	0.05	3.3	NA	NA	NA
Nickel	0.1	<0.01	<0.005	<0.005	<0.005
Selenium	0.05	<0.005	<0.005	<0.005	<0.005
Zinc	5	0.09	0.062	0.029	0.031
ANIONS					
Bicarbonate		420	450	450	500
Carbonate		<10	<10	<10	<10
Chloride		140	95	95	87
Sulfate	250	850	800	880	850
CATIONS					
Calcium		340	310	330	340
Magnesium		85	76	82	82
Potassium		18	23	15	16
Sodium		170	170	190	200
OTHER CHEMISTRIES					
Alkalinity		420	NA	NA	NA
Chromium VI		0.15	NA	NA	NA
Total Dissolved Solids		NA	1600	1700	1900
Conductivity (umhos/cm)		2400	2200	2300	2000
pH (units)	6.5-8.5	7.3	7.5	7.5	7.1

NA Not Analyzed

Shaded areas indicate values above EPA MCLs (Maximum Contaminant Levels).

TABLE 19

SUMMARY OF WATER QUALITY DATA
Syro Compliance Monitor Wells
(in mg/l unless noted otherwise)

Well Identification: MW-5

PARAMETERS	EPA MCLs	SAMPLING DATE			
		12-4-91	5-11-94	8-9-94	11-9-94
DISSOLVED METALS					
Arsenic	0.05	<0.01	<0.005	<0.005	0.012
Cadmium	0.005	<0.005	<0.004	0.007	<0.004
Chromium	0.1	NA	<0.01	[0.01]J	<0.01
Iron	0.3	1.10	16	15	17
Lead	0.015	0.13	<0.005	<0.005	<0.005
Manganese	0.05	3.9	NA	NA	NA
Nickel	0.1	<0.01	<0.005	0.024	0.016
Selenium	0.05	<0.005	<0.005	<0.005	<0.005
Zinc	5	0.33	1.2	1.9	1.9
ANIONS					
Bicarbonate		410	430	430	430
Carbonate		<10	<10	<10	<10
Chloride		120	79	82	70
Sulfate	250	2100	1300	1800	1700
CATIONS					
Calcium		520	410	460	460
Magnesium		210	170	200	200
Potassium		26	28	20	22
Sodium		190	170	190	200
OTHER CHEMISTRIES					
Alkalinity		410	NA	NA	NA
Chromium VI		0.07	NA	NA	NA
Total Dissolved Solids		NA	2500	2600	2700
Conductivity (umhos/cm)		3600	2900	3000	2700
pH (units)	6.5-8.5	7.3	7.3	7.3	6.6
TOC		10	NA	NA	NA
TOX		0.013	NA	NA	NA
VOLATILE ORGANICS					
Benzene	5	<2.0	NA	NA	NA
Carbon tetrachloride	5	<2.0	NA	NA	NA
Chloroform		<2.0	NA	NA	NA
trans 1,2-Dichloroethene		<2.0	NA	NA	NA
Tetrachloroethene	5	<2.0	NA	NA	NA
Toluene		<2.0	NA	NA	NA
Trichloroethene	5	<2.0	NA	NA	NA
SEMIVOLATILE ORGANICS					
2-Chlorophenol		<4.0	NA	NA	NA
4-Nitrophenol		<10	NA	NA	NA
4-Chloro-3-methelphenol		<4.0	NA	NA	NA
Pentachlorophenol		[<10]JS	NA	NA	NA
Phenol		<4.0	NA	NA	NA
Benzo(a)pyrene		<4.0	NA	NA	NA
Butylbenzyl phthalate		<4.0	NA	NA	NA
Chrysene		<4.0	NA	NA	NA
Diethyl phthalate		<4.0	NA	NA	NA
Deimethyl phythalate		<4.0	NA	NA	NA
Flouranthene		<4.0	NA	NA	NA
Pyrene		<4.0	NA	NA	NA

NA Not Analyzed
Shaded areas indicate values above EPA MCLs (Maximum Contaminant Levels).

TABLE 19

SUMMARY OF WATER QUALITY DATA

Syro Compliance Monitor Wells

(in mg/l unless noted otherwise)

Well Identification: MW-6

PARAMETERS	EPA MCLs	SAMPLING DATE			
		12-5-91	5-10-94	8-10-94	11-8-94
DISSOLVED METALS					
Arsenic	0.05	0.010	0.04	0.05	0.053
Cadmium	0.005	0.11	0.089	0.11	0.10
Chromium	0.1	NA	<0.01	0.04	<0.01
Iron	0.3	460	390	430	450
Lead	0.015	0.023	<0.005	0.006	0.009
Manganese	0.05	9.2	NA	NA	NA
Nickel	0.1	0.47	0.2	0.32	0.32
Selenium	0.05	<0.005	<0.005	<0.005	<0.005
Zinc	5	450	350	380	370
ANIONS					
Bicarbonate		48	45	18	14
Carbonate		<10	<10	<10	<10
Chloride		700	220	250	230
Sulfate	250	4200	4500	3900	4100
CATIONS					
Calcium		660	500	550	580
Magnesium		440	230	260	280
Potassium		34	30	23	26
Sodium		460	220	250	280
OTHER CHEMISTRIES					
Alkalinity		48	NA	NA	NA
Chromium VI		0.15	NA	NA	NA
Total Dissolved Solids		NA	5200	5500	5700
Conductivity (umhos/cm)		5500	5200	4700	4100
pH (units)	6.5-8.5	5.6	5.1	5.4	4.8
TOC		33	NA	NA	NA
TOX		0.007	NA	NA	NA
VOLATILE ORGANICS					
Benzene	.005 X 5	<2.0	<2.0	<2.0	<2.0
Carbon tetrachloride		<2.0	<2.0	<2.0	<2.0
Chloroform		<2.0	<2.0	<2.0	<2.0
trans 1,2-Dichloroethene		<2.0 T	<2.0	<2.0	<2.0
Tetrachloroethene	5	11	20	13	16
Toluene		<2.0	<2.0	<2.0	<2.0
Trichloroethene	5	9.6	14	13	15
SEMIVOLATILE ORGANICS					
2-Chlorophenol		<4.0	NA	NA	NA
4-Nitrophenol		<10	NA	NA	NA
4-Chloro-3-methelphenol		<4.0	NA	NA	NA
Pentachlorophenol		(<10) JS	NA	NA	NA
Phenol		<4.0	NA	NA	NA
Benzo(a)pyrene		<4.0	NA	NA	NA
Butylbenzyl phthalate		<4.0	NA	NA	NA
Chrysene		<4.0	NA	NA	NA
Diethyl phthalate		<4.0	NA	NA	NA
Deimethyl phythalate		<4.0	NA	NA	NA
Flouranthene		<4.0	NA	NA	NA
Pyrene		<4.0	NA	NA	NA

NA Not Analyzed

Shaded areas indicate values above EPA MCLs (Maximum Contaminant Levels).

TABLE 19

SUMMARY OF WATER QUALITY DATA
Syro Compliance Monitor Wells
(in mg/l unless noted otherwise)

Well Identification: MW-7

PARAMETERS	EPA MCLs	SAMPLING DATE			
		5-10-94	8-9-94	11-8-94	
DISSOLVED METALS					
Arsenic	0.05	<0.005	<0.005	0.012	
Cadmium	0.005	<0.004	<0.004	<0.004	
Chromium	0.1	<0.01	<0.01	<0.01	
Iron	0.3	0.52	<0.01	0.60	
Lead	0.015	<0.005	<0.005	<0.005	
Nickel	0.1	<0.005	<0.005	0.007	
Selenium	0.05	<0.005	<0.005	<0.005	
Zinc	5	0.13	0.016	0.025	
ANIONS					
Bicarbonate		430	410	390	
Carbonate		<10	<10	<10	
Chloride		110	110	83	
Sulfate	250	480	480	350	
CATIONS					
Calcium		200	200	160	
Magnesium		76	64	56	
Potassium		24	8.2	8.3	
Sodium		130	130	120	
OTHER CHEMISTRIES					
Total Dissolved Solids		1100	1000	870	
Conductivity (umhos/cm)		2200	1600	1300	
pH (units)	6.5-8.5	7.6	7.7	6.8	

NA Not Analyzed
Shaded areas indicate values above EPA MCLs (Maximum Contaminant Levels).

TABLE 19

SUMMARY OF WATER QUALITY DATA

Syro Compliance Monitor Wells

(in mg/l unless noted otherwise)

Well Identification: MW-8

PARAMETERS	EPA MCLs	SAMPLING DATE			
		5-10-94	8-9-94	11-8-94	
DISSOLVED METALS					
Arsenic	0.05	<0.005	0.007	0.009	
Cadmium	0.005	<0.004	<0.004	<0.004	
Chromium	0.1	<0.01	<0.01	<0.01	
Iron	0.3	0.09	0.32	1.1	
Lead	0.015	<0.005	<0.005	0.006	
Nickel	0.1	<0.005	<0.005	[0.005]J	
Selenium	0.05	<0.005	<0.005	<0.005	
Zinc	5	0.12	0.14	0.025	
ANIONS					
Bicarbonate		450	330	380	
Carbonate		<10	<10	<10	
Chloride		390	290	420	
Sulfate	250	85	32	42	
CATIONS					
Calcium		220	170	230	
Magnesium		61	43	63	
Potassium		<0.01	6	4.7	
Sodium		200	150	230	
OTHER CHEMISTRIES					
Total Dissolved Solids		1300	990	1300	
Conductivity (umhos/cm)		2700	1700	2100	
pH (units)	6.5-8.5	7.3	7.5	7.0	

NA Not Analyzed

Shaded areas indicate values above EPA MCLs (Maximum Contaminant Levels).

TABLE 19

SUMMARY OF WATER QUALITY DATA

Syro Compliance Monitor Wells

(in mg/l unless noted otherwise)

Well Identification: DG-4

PARAMETERS	EPA MCLs	SAMPLING DATE			
		12-4-91	5-11-94	8-10-94	11-8-94
DISSOLVED METALS					
Arsenic	0.05	<0.01	<0.005	<0.005	<0.005
Cadmium	0.005	0.12	0.082	0.09	0.069
Chromium	0.1	NA	0.01	0.03	<0.01
Iron	0.3	330	200	220	190
Lead	0.015	0.04	<0.005	0.006	0.008
Manganese	0.05	7.3	NA	NA	NA
Nickel	0.1	0.52	0.27	0.33	0.28
Selenium	0.05	<0.005	<0.005	<0.005	<0.005
Zinc	5	480	310	330	300
ANIONS					
Bicarbonate		20	61	87	74
Carbonate		<10	<10	<10	<10
Chloride		18	140	150	100
Sulfate	250	4000	2900	3300	3100
CATIONS					
Calcium		650	520	570	610
Magnesium		250	200	230	210
Potassium		13	17	12	14
Sodium		360	170	200	170
OTHER CHEMISTRIES					
Alkalinity		20	NA	NA	NA
Chromium VI		<0.05	NA	NA	NA
Total Dissolved Solids		NA	4200	4600	4300
Conductivity (umhos/cm)		5000	4100	4100	3300
pH (units)	6.5-8.5	5.2	6.2	6.4	5.8

NA Not Analyzed

Shaded areas indicate values above EPA MCLs (Maximum Contaminant Levels).

TABLE 19

SUMMARY OF WATER QUALITY DATA

Syro Compliance Monitor Wells

(in mg/l unless noted otherwise)

Well Identification: UG Well

PARAMETERS	EPA MCLs	SAMPLING DATE			
		12-4-91	11-8-94		
DISSOLVED METALS					
Arsenic	0.05	<0.01	<0.005		
Cadmium	0.005	<0.005	<0.004		
Chromium	0.1	NA	<0.01		
Iron	0.3	0.06	0.02		
Lead	0.015	0.014	[0.005]J		
Manganese	0.05	0.34	NA		
Nickel	0.1	0.07	0.009		
Selenium	0.05	<0.005	<0.005		
Zinc	5	0.05	0.020		
ANIONS					
Bicarbonate		390	380		
Carbonate		<10	<10		
Chloride		220	140		
Sulfate	250	99	89		
CATIONS					
Calcium		140	180		
Magnesium		44	53		
Potassium		5.5	3.9		
Sodium		80	83		
OTHER CHEMISTRIES					
Alkalinity		390	NA		
Chromium VI		0.15	NA		
Total Dissolved Solids		NA	830		
Conductivity (umhos/cm)		1200	1300		
pH (units)	6.5-8.5	7.5	6.8		

NA Not Analyzed

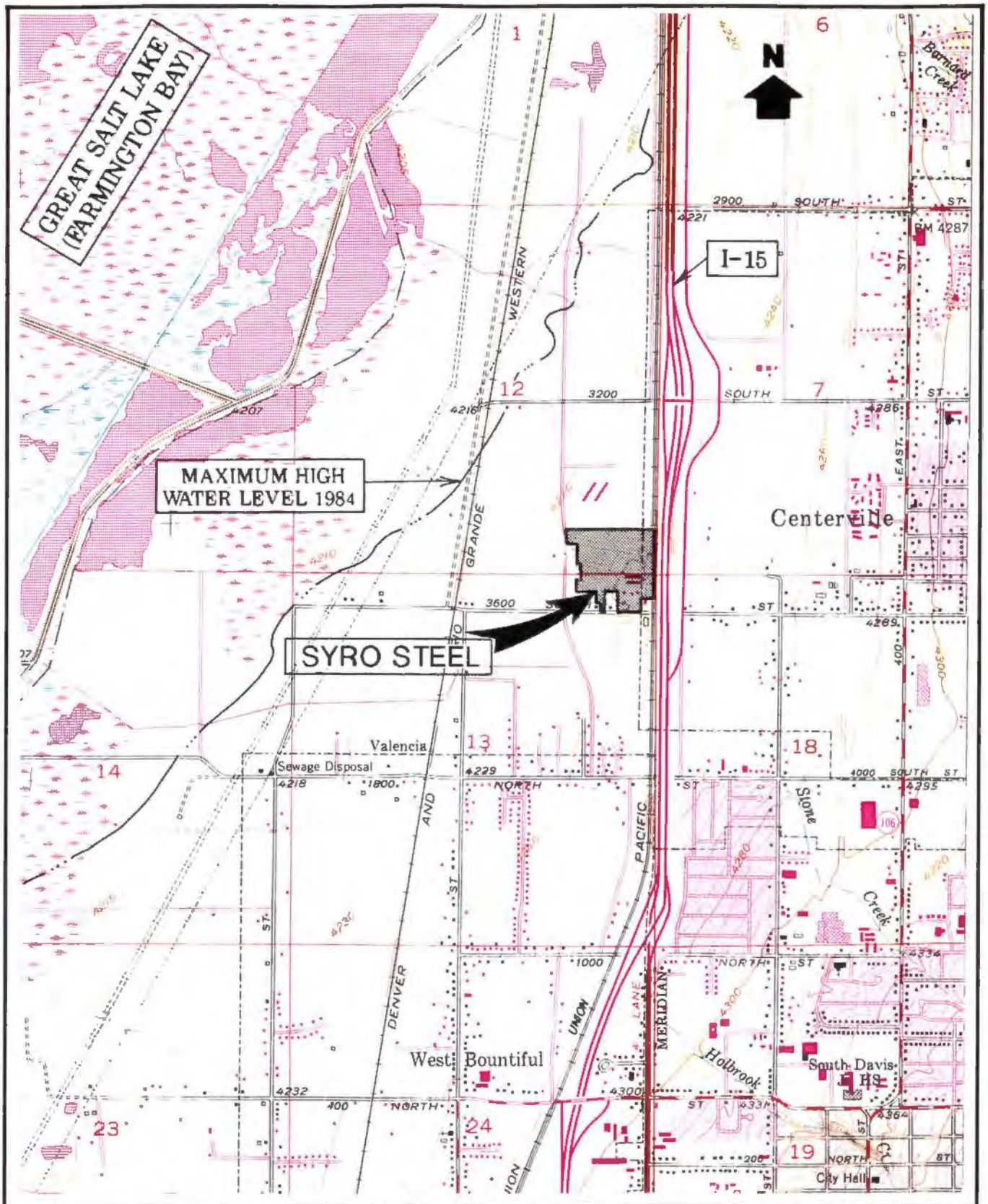
TABLE 20

SYRO, INC.
SUMMARY OF RFI BACKGROUND SOIL CONCENTRATIONS (mg/kg)

Sample Location	Sample Date	Parameter										
		Cr	Fe	Pb	Zn	SO4	pH	As	Cd	Mn	Ni	Se
D2-A	4/84	54	21,000	20	69	690	8.0					
D2-B	4/84	15	9,500	15	380	830	8.1					
D2-C	4/84	42	22,000	19	130	240	8.7					
E2-A	4/84	38	19,000	23	78	145	8.1					
E2-B	4/84	54	25,000	14	56	205	8.7					
E2-E	4/84	44	23,000	63	800	205	8.1					
G9-C	4/84	31	15,000	9.2	60	105	8.6					
G9-D	4/84	51	24,000	18	73	2	8.4					
G9-E	4/84	47	21,000	19	75	16	7.9					
F2-B	4/84	55	25,000	18	67	21	8.5					
F2-C	4/84	43	18,000	11	100	245	8.7					
F2-D	4/84	52	22,000	31	190	50	7.9					
F9-B	4/84	57	28,000	13	72	100	8.5					
F9-C	4/84	54	24,000	16	72	7	8.2					
F9-D	4/84	53	24,000	27	93	7	7.5					
H9-A	11/83	13	22,000	8.9	58	140	8.5					
H9-B	11/83	15	27,000	8.3	52	20	8.4					
H9-E	11/83	20	30,000	10	58	80	8.7					
H9-H	11/83	14	15,000	46	170	50	7.9					
H9-I	11/83	14	14,000	28	98	50	8.1					
H9-J	11/83	17	17,000	47	130	20	8.0					
H1-1b	4/91	30	13,000	80	89	120	8.3	6.7	<.05	420	48	<.01
H1-2b	4/91	29	11,000	61	220	80	8.2	79	<.05	330	41	<.01
H1-3b	4/91	23	5,700	80	100	80	8.2	5	<.05	290	35	<.01
H9-1	4/91	57	20,000	51	100	20	8.8	24	<.05	420	74	<.01
H9-2	4/91	45	15,000	39	89	280	8.5	16	<.05	300	56	<.01
H9-3	4/91	54	9,500	38	87	26	9.4	8.8	<.05	410	70	<.01
MEAN =		37.8	19248	30	132	142	8.3	23.3	0	362	54	0
STD =		15.9	6082	21	147	193	0.4	25.7	0	56	14	0
* UCL =		85.6	37494	93	574	721	7.2-9.4	100	0	531	97	0

12/8/94

* UCL = Upper Concentration Limit; numbers that define the baseline standard.



REFERENCE:
U.S.G.S. QUADRANGLE ENTITLED "FARMINGTON, UTAH" DATED 1952 AND PHOTOREVISED 1969 AND 1975

0 2000 4000

Scale in Feet

BINGHAM ENVIRONMENTAL
SALT LAKE CITY – (801) 532-2230

SYRO STEEL COMPANY

VICINITY MAP

FIGURE 1

RICKS DITCH

DRAINAGE SWALE

SOLID WASTE MANAGEMENT UNIT #1

SOIL STOCKPILES (SWMU #5)

RCRA SURFACE IMPOUNDMENT (SWMU #4)

8" CLAY PIPE (REMOVED)

SOLID WASTE MANAGEMENT UNIT #2

SUMP (REMOVED)

6" CLAY PIPE SOLID WASTE MANAGEMENT UNIT # 3

PORTER LANE

OFFICE TRAILER

MAIN OFFICE

OFFICE TRAILER

SHIPPING BUILDING

STORAGE TRAILER

SPLITTER BOX

SAW SHOP

GALVANIZING BUILDING

FABRICATION BUILDING

YARD CRANE

ROLLING MILL BUILDING

IRRIGATION DITCH

UP&L POWER SUBSTATION

RAILROAD SPUR

IRRIGATION TURNOUT

CONCRETE LINED CANAL

UNION PACIFIC RAILROAD

0 40 80 120

Scale in Feet

SYRO STEEL COMPANY

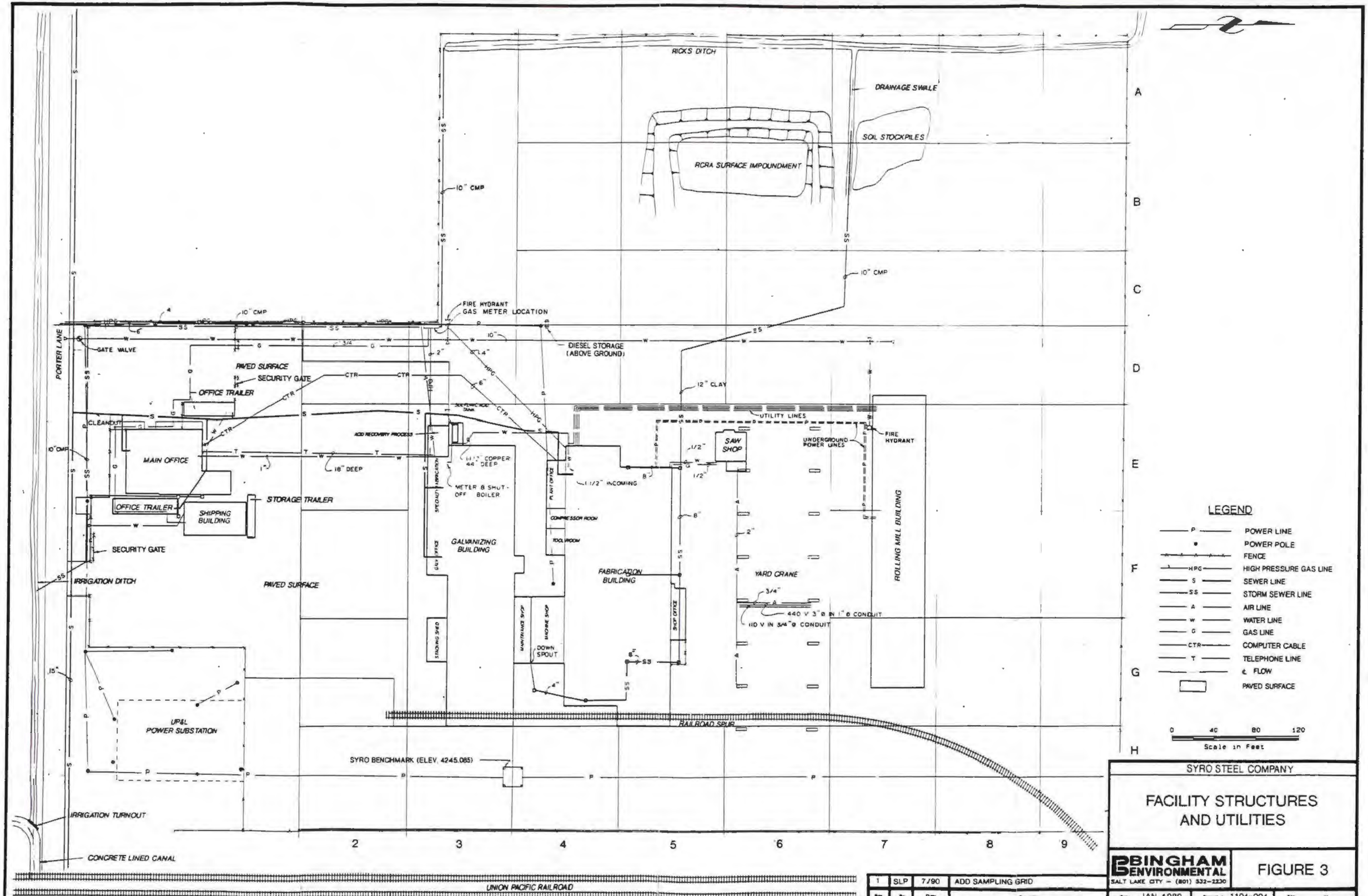
SOLID AND HAZARDOUS WASTE MANAGEMENT UNITS

BINGHAM ENVIRONMENTAL
SALT LAKE CITY – (801) 532-2230

FIGURE 2

No.	By	Date	Remarks
1	MT	6/28/94	Remove outline of SWMU #6

Date: JAN 1989 | Project: 1104-004



LEGEND

- P — POWER LINE
- POWER POLE
- FENCE
- HPG — HIGH PRESSURE GAS LINE
- S — SEWER LINE
- SS — STORM SEWER LINE
- A — AIR LINE
- W — WATER LINE
- G — GAS LINE
- CTR — COMPUTER CABLE
- T — TELEPHONE LINE
- ℄ FLOW
- PAVED SURFACE

0 40 80 120
Scale in Feet

SYRO STEEL COMPANY

FACILITY STRUCTURES AND UTILITIES

No.	By	Date	Remarks
1	SLP	7/90	ADD SAMPLING GRID

BINGHAM ENVIRONMENTAL
SALT LAKE CITY – (801) 532-2230

FIGURE 3

Date: JAN 1989 | Project: 1104-004

RICKS DITCH

4229.09 / 4228.5 — DG-6
4227.98 / 4227.5 — DG-5
4228.02 / 4227.5 — DG-4
DG-3
MW-6
NA / 4230.4 — DG-1
NA / 4234.8 — MH-4
4229.61 / 4228.8
4229.57 / 4228.1
DRAINAGE SWALE
MH-2
4230.29 / 4226.9
DETENTION BASIN
SOIL STOCKPILES
4230.82 / 4230.1 — DG-2
RCRA SURFACE IMPOUNDMENT
4239.12 / 4238.4 — SYRO WELL
IRRIGATION DITCH
FLOOD ZONE B
PORTER LANE
4243.04 / 4240.2 — MH-3
OFFICE TRAILER
MAIN OFFICE
STORAGE TRAILER
OFFICE TRAILER
SHIPPING BUILDING
UG
4243.00 / 4243.0
SAW SHOP
GALVANIZING BUILDING
FABRICATION BUILDING
YARD CRANE
ROLLING MILL BUILDING
IRRIGATION DIVERSION
(TO DIVERT WATER VIA THE SANITARY STORM SEWER TO RICKS DITCH)
UP&L POWER SUBSTATION
RAILROAD SPUR
4245.91 / 4243.9
IRRIGATION TURNOUT
MH-5
FLOOD ZONE AO (DEPTH 2')
CONCRETE LINED CANAL
UNION PACIFIC RAILROAD
4243.61 / 4242.1 — MH-1

SS — STORM SEWER

LEGEND

- PIEZOMETER
- MONITOR WELL
- CATCH BASIN OR DRAIN
- SS — STORM SEWER
- 4231.57 / 4231.0 — TOP OF PVC ELEVATION / GROUND ELEVATION
- 4243.0 / 4241.7 — TOP OF PVC CASING ELEVATION / GROUND ELEVATION

EXPLANATION OF FLOOD ZONE DESIGNATIONS

AO — Areas of 100 year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined

B — Areas between limits of the 100 year flood and 500 year flood; or certain areas subject to 100 year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood.

NOTE: No 100 or 500 year flooding indentified on property

SOURCE: FLOOD INSURANCE RATE MAP EFFECTIVE: MARCH 1, 1982

0 40 80 120
Scale in Feet

SYRO STEEL COMPANY

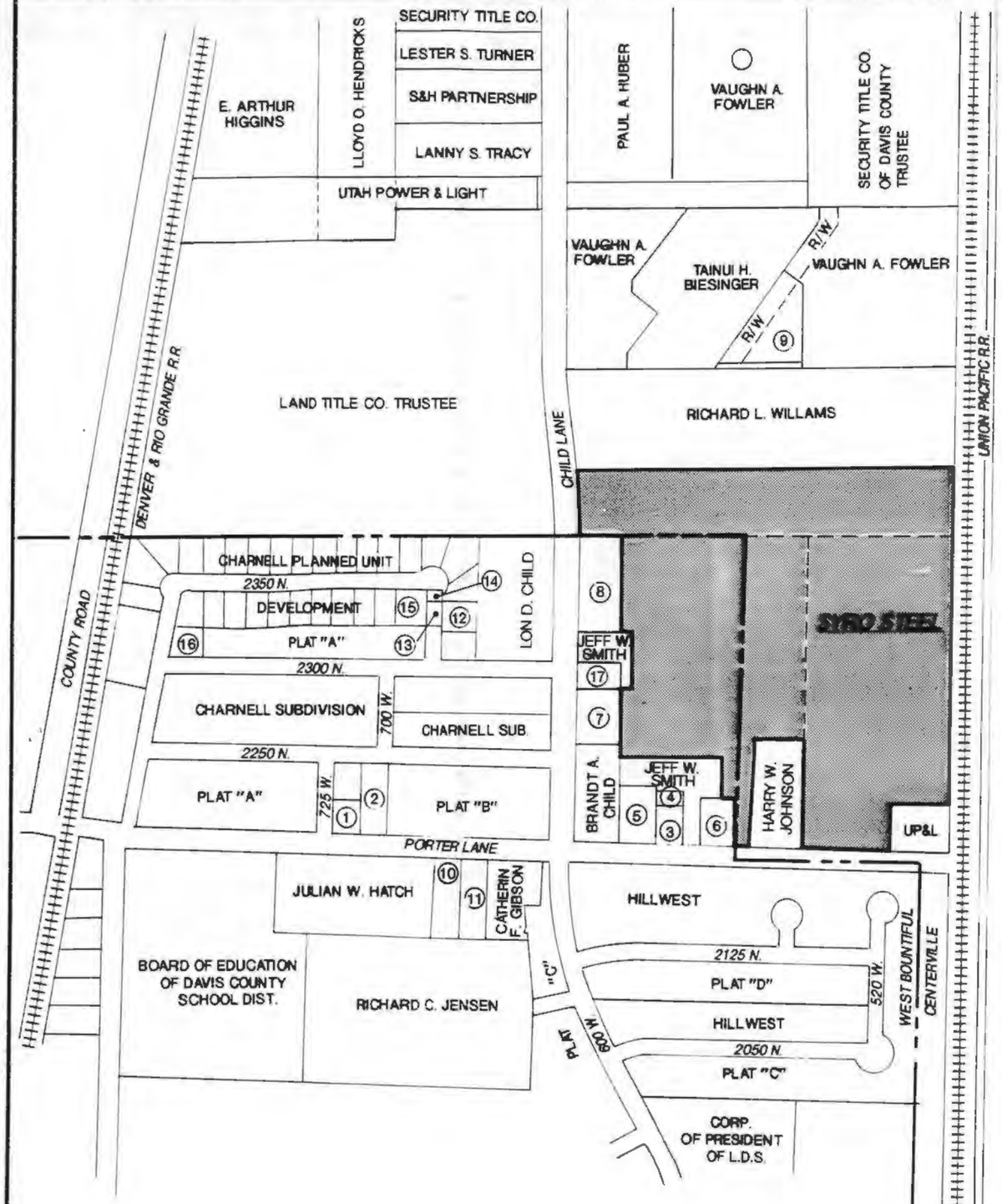
TOPOGRAPHY, SURFACE WATER FEATURES AND MONITORING WELL LOCATIONS

BINGHAM ENVIRONMENTAL
SALT LAKE CITY - (801) 532-2230

FIGURE 4

No.	By	Date	Revisions
1	GH	2/1/90	ADD ELEVATIONS TO WELLS

Date: JAN. 1989 | Project: 1104-004



PROPERTY OWNERSHIP KEY

1. SCOTT CRAIG DARUIS
2. ROGER BARRUS
3. GORDON B. RICKS
4. GORDON B. RICKS
5. MICHAEL W. DIETRICH
6. DOUGLAS PARRISH
7. LYNN L. BARBER
8. LAWRENCE BARBER TRUSTEES
9. VAUGHN A. FOWLER
10. BRAD DEVEREAUX
11. STEVE D. DEVEREAUX
12. KENNETH ELLIS CLYDE
13. WEST BOUNTIFUL CITY
14. WEST BOUNTIFUL CITY
15. LON D. CHILD
16. DONALD A. FORBES
17. JOHN DEMARCO

SOURCE: DAVIS COUNTY SECTION MAPS 5/91

0 400 800

Scale in Feet

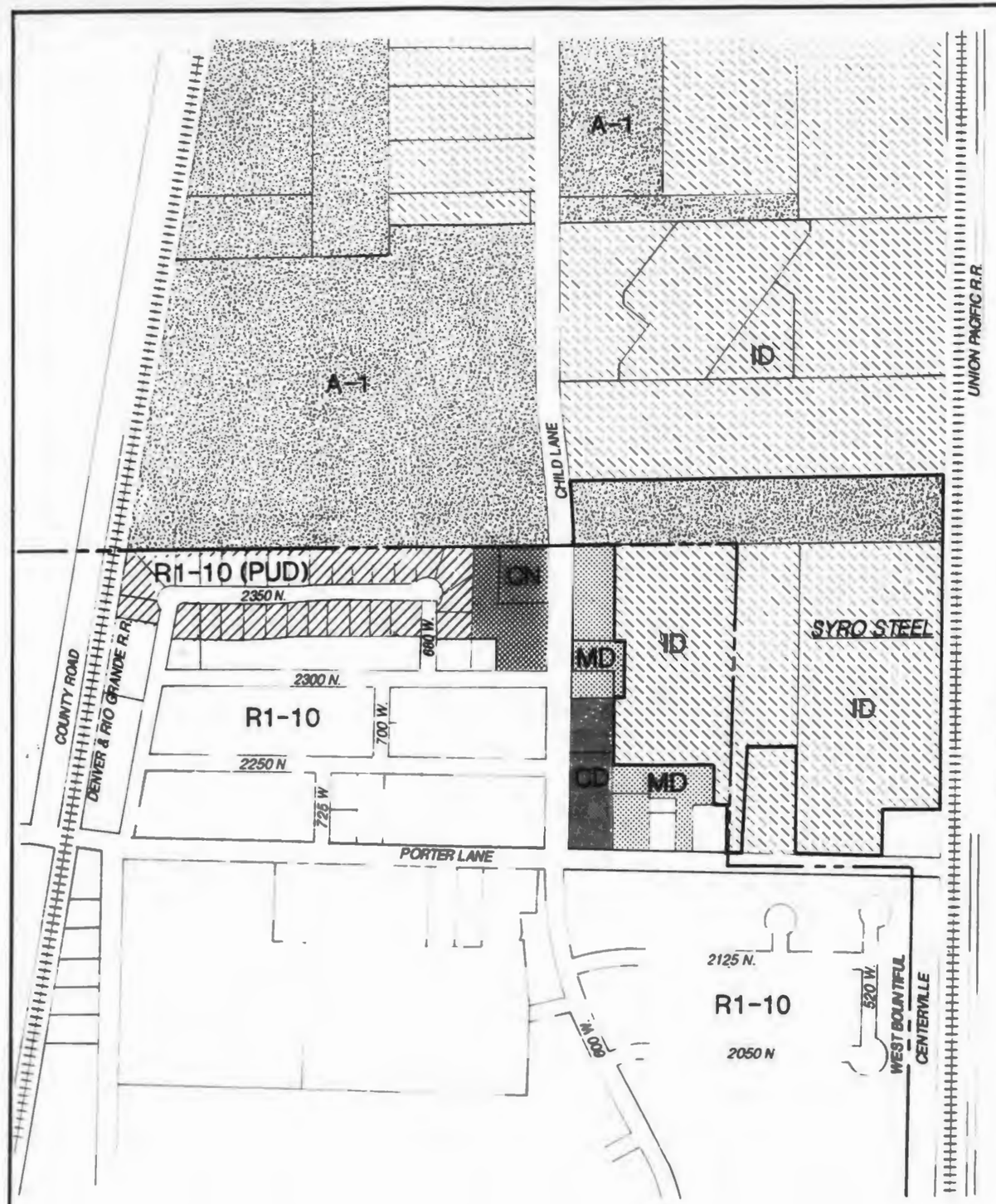
SYRO STEEL COMPANY

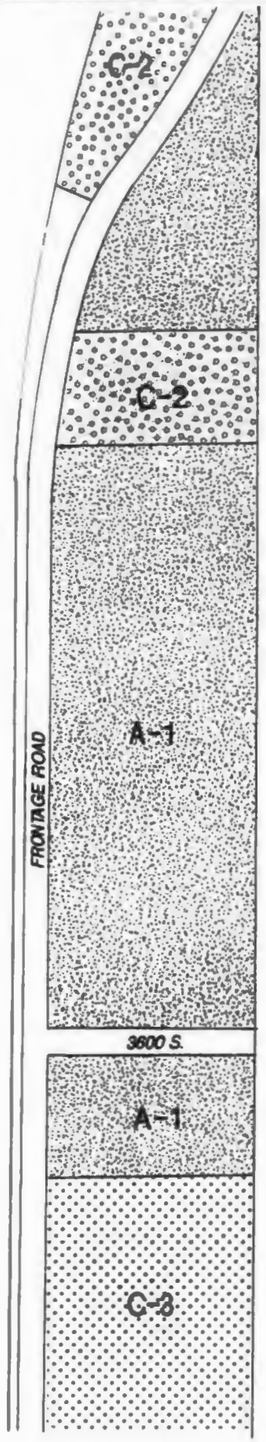
PROPERTY OWNERSHIP MAP

BINGHAM ENVIRONMENTAL
SALT LAKE CITY - (801) 532-2230

FIGURE 5

Date: MAY 1991 | Proj. # 1104-007 | T.M.





LAND USE CLASSIFICATION LEGEND

CENTERVILLE CITY DESIGNATIONS

- A-1 - AGRICULTURAL DISTRICT
- ID - INDUSTRIAL DEVELOPMENT DISTRICT
- C-2 - COMMERCIAL DISTRICT
- C-3 - COMMERCIAL DISTRICT

WEST BOUNTIFUL CITY DESIGNATIONS

- R1-10 - SINGLE FAMILY RESIDENTIAL 10,000 SQ.FT. LOT
- MD - LIGHT MANUFACTURING
- CD - CONDITIONAL USE
- CN - NEIGHBORHOOD COMMERCIAL
- R1-10 (PUD) - SINGLE FAMILY RESIDENTIAL (PLANNED UNIT DEVELOPMENT)

SOURCES:

1. CITY OF WEST BOUNTIFUL ZONING MAP JAN. 1989
2. ZONING MAP OF CENTERVILLE REVISED, ADOPTED NOV. 3, 1987

0 400 800

Scale in Feet

SYRO STEEL COMPANY

LAND USE MAP

BINGHAM ENVIRONMENTAL
SALT LAKE CITY - (801) 532-2230

FIGURE 6

Date APRIL 1991 | Proj. # 1104-007 | T.M.

06/17/1994 F:\PROJ\1104\CAD\1104EXPL

600 W.

CHILD LANE

PORTER LANE

RCK-6

DH-46 DH-47 DH-48

COMMERCIAL BUILDINGS

B

C

P-10

DH-32

MW 7

DH-33

DH-31

OS-1

DH-23 DH-27 DH-28

P-5

MW-1

P-4

DH-49

DH-26 DH-25 DH-24 DH-45

P-9

DH-51

P-7

MW-4

P-8

RICKS DITCH

DH-22 DH-21 DH-20 DH-6 MW-2 DH-19 DH-18

P-3

DH-17

A

A'

MW-5 DH-50

DH-16 DH-16 P-6 DH-15 DH-14 DH-42 DH-13 DH-43 DH-4 P-2 DH-4 DH-12 MW-3 DH-11 DH-11 P-1

RCK-5 RCK-4 RCK-3 RCK-2 RCK-1

DH-10

DG-6 DG-5

DG-3 DH-3 MW-6 DH-39 DG-4 MH-2 DH-30

MH-4

DH-38

DG-1 DH-41 DH-40

DG-2 DH-2 DH-9 DH-29

SWMU #1

DH-7

DH-8

SYRO WELL

DH-1

RCRA SURFACE IMPOUNDMENT

DH-37

MH-3

DH-36

DH-35

SWMU #2

C'

B'

ROLLING MILL BUILDING

SAW SHOP

FABRICATION BUILDING

GALVANIZING BUILDING

CLAY PIPELINE

OFFICE TRAILER

MAIN OFFICE

STORAGE TRAILER

UG-WELL

LEGEND

- PIEZOMETERS
- MONITOR WELLS
- EXPLORATORY DRILL HOLES
- PHASE 1 GROUNDWATER SAMPLING HOLES
- RICKS DITCH SAMPLES
- A A — LINE OF CROSS SECTION

0 50 100 150

Scale in Feet

SYRO, INC.

EXPLORATION LOCATION MAP

BINGHAM ENVIRONMENTAL
SALT LAKE CITY - (801) 532-2230

FIGURE 7A

Rev	By	Date	Remarks
1	MT	6/13/94	ADD CLAY PIPELINE & NEW WELL

Date JUNE 1994 | Proj # 1104-007 | TM

05/01/1994 F:\PROJ\1104\CAD\1104MW1A

CHILD LANE

PORTER LANE

COMMERCIAL BUILDINGS

P-10

MW-7

RICKS DITCH

MW-1

P-4

P-5

DH-45

P-9

P-7

MW-4

P-8

MW-2

P-3

MW-5

P-6

DH-42

P-2

DH-43

DH-44

RICKS DITCH

MW-3

P-1

DG-6 (AB)

DG-5 (AB)

DG-4

MH-2

MH-4

DH-41

DG-1 (AB)

MW-6

DG-3 (AB)

SWMU #1

DG-2 (AB)

RCRA SURFACE IMPOUNDMENT

SYRO WELL (AB)

SWMU #2

MH-3

OFFICE TRAILER

MAIN OFFICE

STORAGE TRAILER

SHIPPING BUILDING

OFFICE TRAILER

UG-1

GALVANIZING BUILDING

FABRICATING BUILDING

SAW SHOP

ROLLING MILL BUILDING

UP&L POWER SUBSTAION

MH-5

MW-8

MH-1

LEGEND

PIEZOMETERS

MONITOR WELLS INCLUDED IN NETWORK

(AB) MONITOR WELLS ABANDONED (APRIL 1994)

0 60 120 180

Scale in Feet

SYRO, INC.

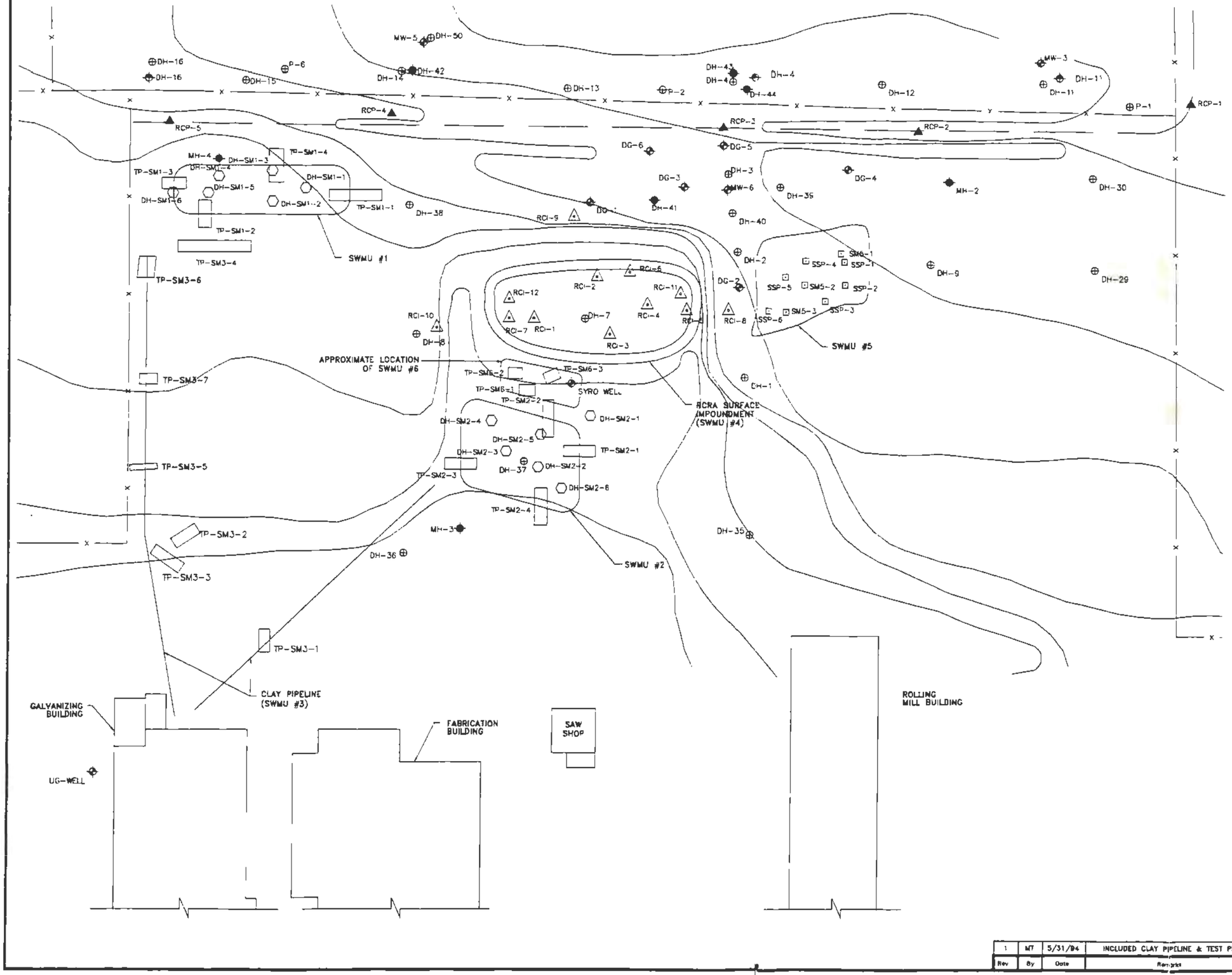
MONITOR WELL NETWORK

BINGHAM ENVIRONMENTAL

SALT LAKE CITY - (801) 532-2230

FIGURE 7B

No.	By	Date	Remarks	Date MAY 1994	Proj # 1104-008	TM



SYRO, INC

SOLID WASTE MANAGEMENT UNITS EXPLORATION LOCATION MAP

BINGHAM ENVIRONMENTAL
SALT LAKE CITY - (801) 532-2230

FIGURE 8

Rev	By	Date	Remarks	Date	Proj #	
1	MT	5/31/94	INCLUDED CLAY PIPELINE & TEST PITS	MAY 1994	1104-007	TM

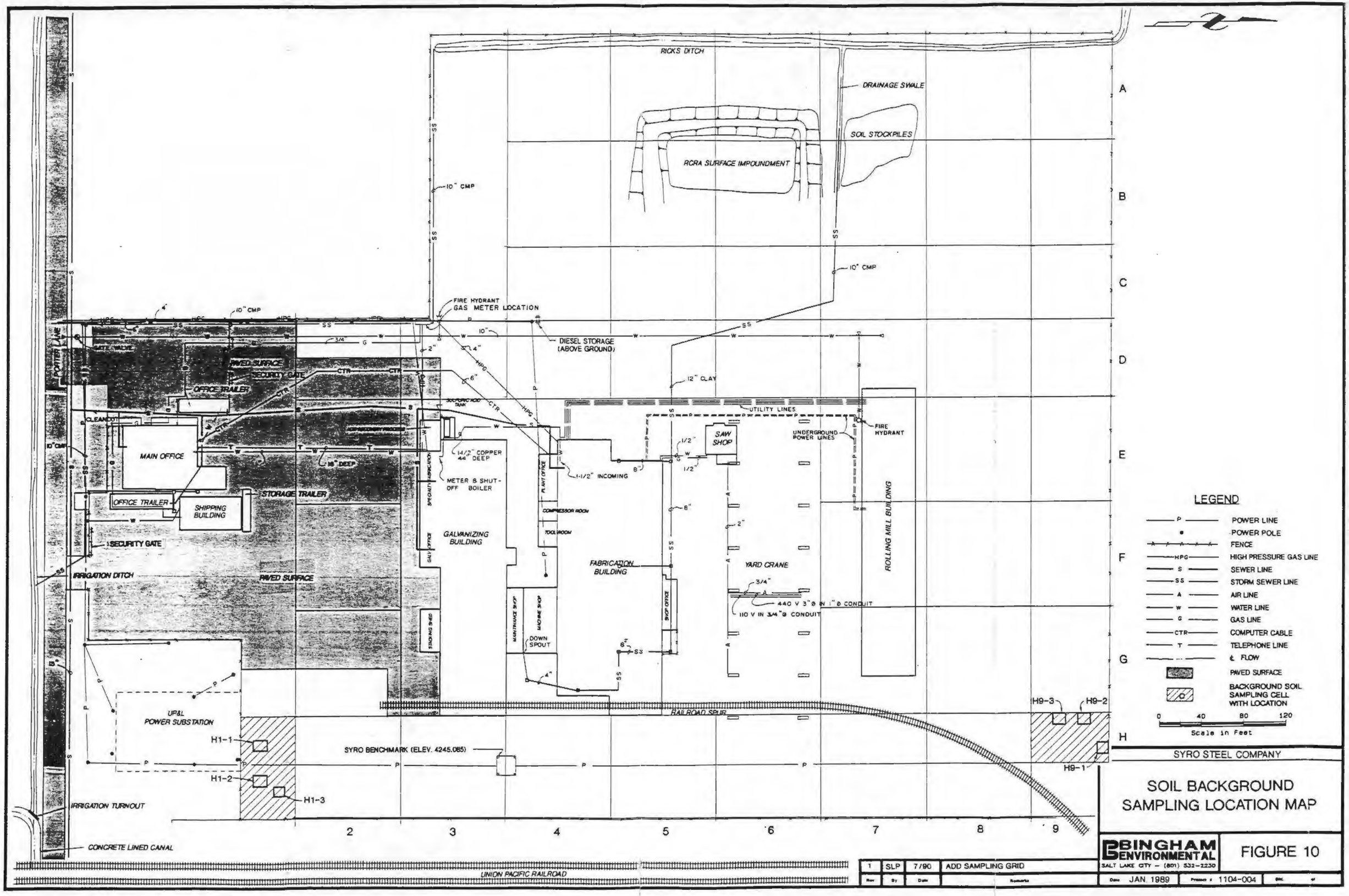
SYRO STEEL COMPANY

OFF SITE SAMPLING LOCATIONS

BINGHAM ENVIRONMENTAL
SALT LAKE CITY – (801) 532-2230

FIGURE 9

Date APRIL 1991 | Project # 1104-004 | Sht. of



SYRO STEEL COMPANY

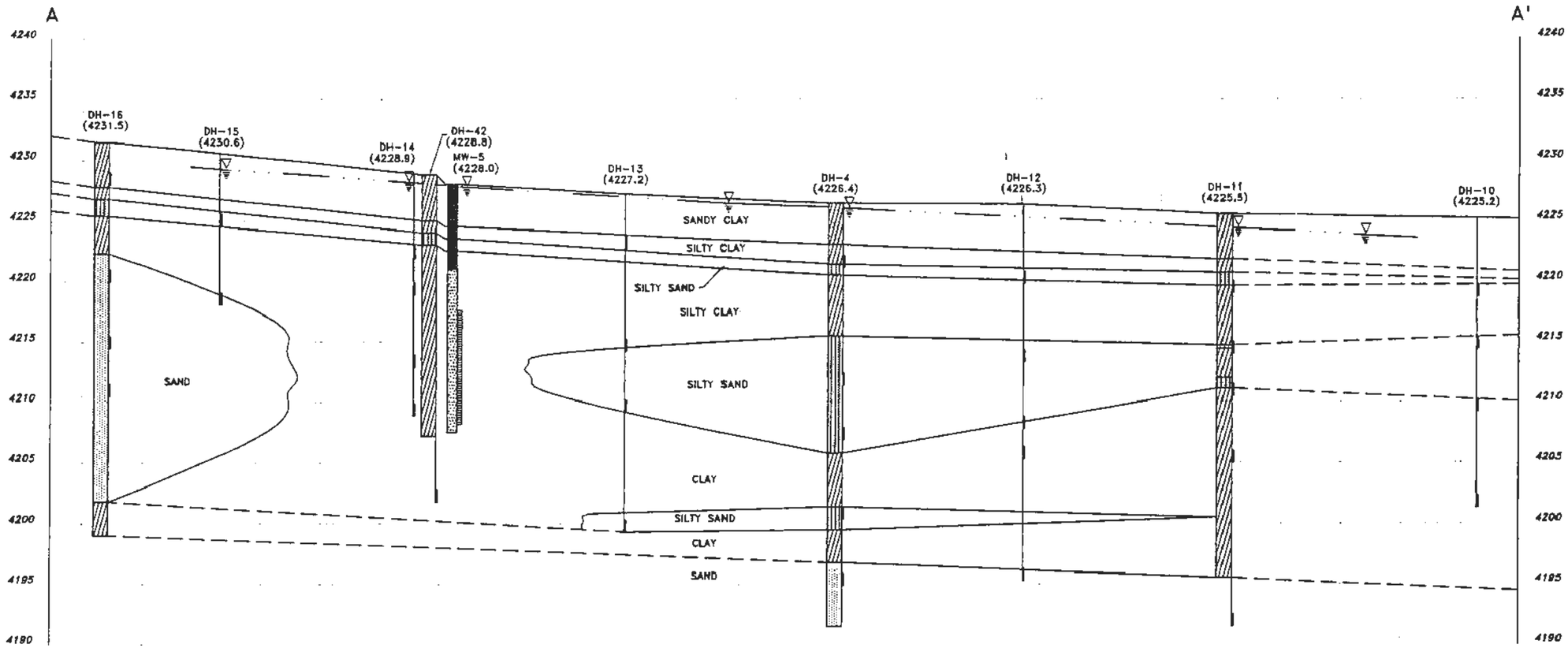
SOIL BACKGROUND SAMPLING LOCATION MAP

Rev	By	Date	Remarks
1	SLP	7/90	ADD SAMPLING GRID

BINGHAM ENVIRONMENTAL
SALT LAKE CITY – (801) 532-2230

FIGURE 10

Date JAN. 1989 | Project # 1104-004



LEGEND

- SANDY CLAY
- SILTY CLAY
- SILTY SAND
- SAND
- BENTONITE & CEMENT SEAL
- WELL SAND PACK
- SCREEN
- GROUNDWATER LEVEL MEASURED ON DECEMBER 2, 1991
- PENETROMETER HOLE
- GROUNDWATER SAMPLE LOCATION

0 30 60 90
Scale in Feet
HORIZONTAL SCALE

0 5 10 15
Scale in Feet
VERTICAL SCALE

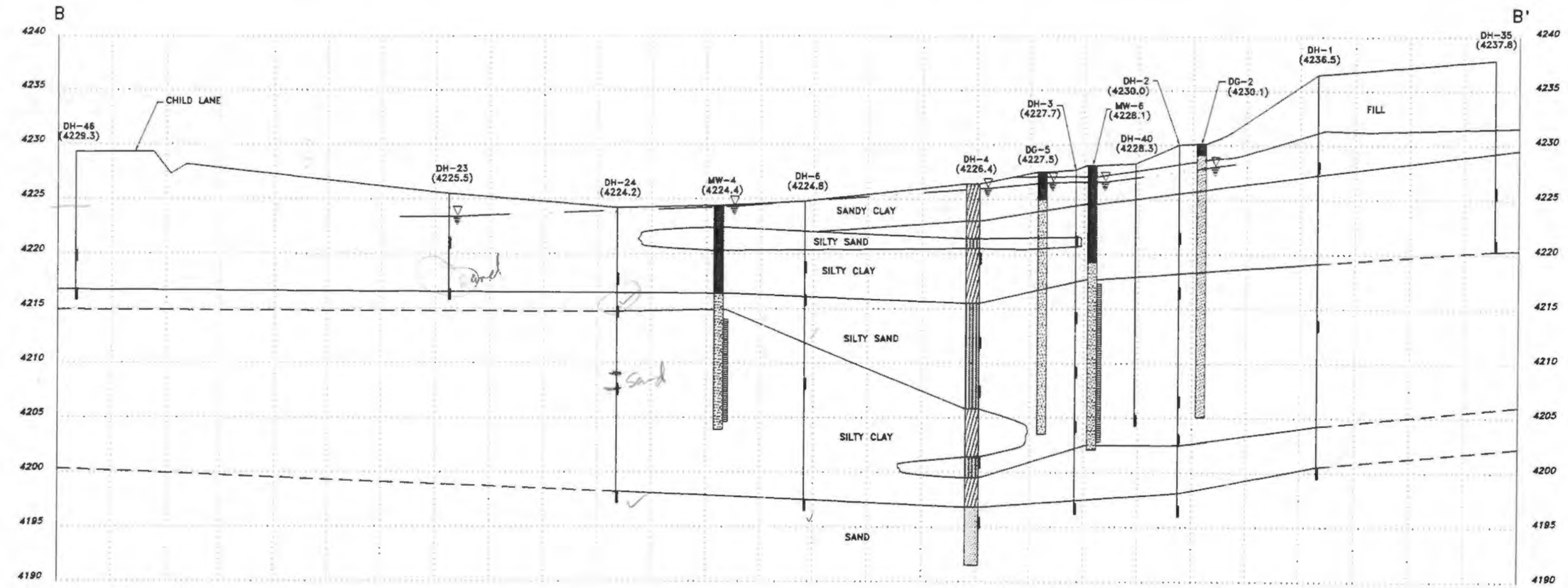
SYRO STEEL COMPANY

HYDROGEOLOGIC CROSS SECTION A–A'

BINGHAM ENVIRONMENTAL
SALT LAKE CITY – (801) 532-2230

FIGURE 11

Rev.	By	Date	Remarks	Date APRIL 1991	Proj # 1104-007	T.M. SYSECA-A



LEGEND

- FILL
- SANDY CLAY
- SILTY CLAY
- SILTY SAND
- SAND
- BENTONITE & CEMENT SEAL
- WELL SAND PACK
- SCREEN
- GROUNDWATER LEVEL MEASURED ON DECEMBER 2, 1991
- PENETROMETER HOLE
- GRONDWATER SAMPLE LOCATION

0 30 60 90
Scale in Feet
HORIZONTAL SCALE

0 5 10 15
Scale in Feet
VERTICAL SCALE

SYRO, INC.

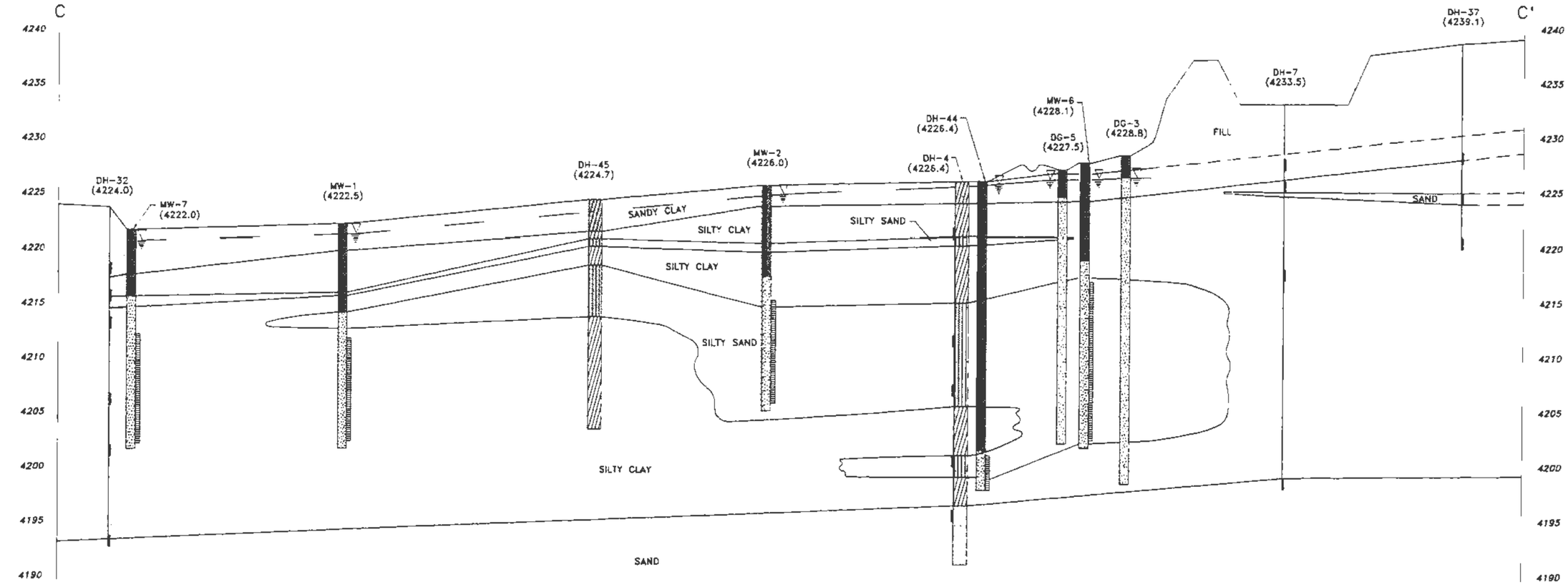
HYDROGEOLOGIC CROSS SECTION B–B'

BINGHAM ENVIRONMENTAL
SALT LAKE CITY – (801) 532–2230

FIGURE 12

Rev.	By	Date	Remarks	Date JUNE 1994	Proj. # 1104–007	TM

08/17/1994 F:\PROJ\1104\CAD\STSECC-C



LEGEND

- FILL
- SANDY CLAY
- SILTY CLAY
- SILTY SAND
- SAND
- BENTONITE & CEMENT SEAL
- WELL SAND PACK
- SCREEN
- GROUNDWATER LEVEL MEASURED ON DECEMBER 2, 1991
- PENETROMETER HOLE
- GROUNDWATER SAMPLE LOCATION

0 30 60 90
Scale in Feet
HORIZONTAL SCALE

0 5 10 15
Scale in Feet
VERTICAL SCALE

Rev	By	Date	Remarks
-	MT	6/14/94	ADD MW-7 & DH-45

SYRO, INC.

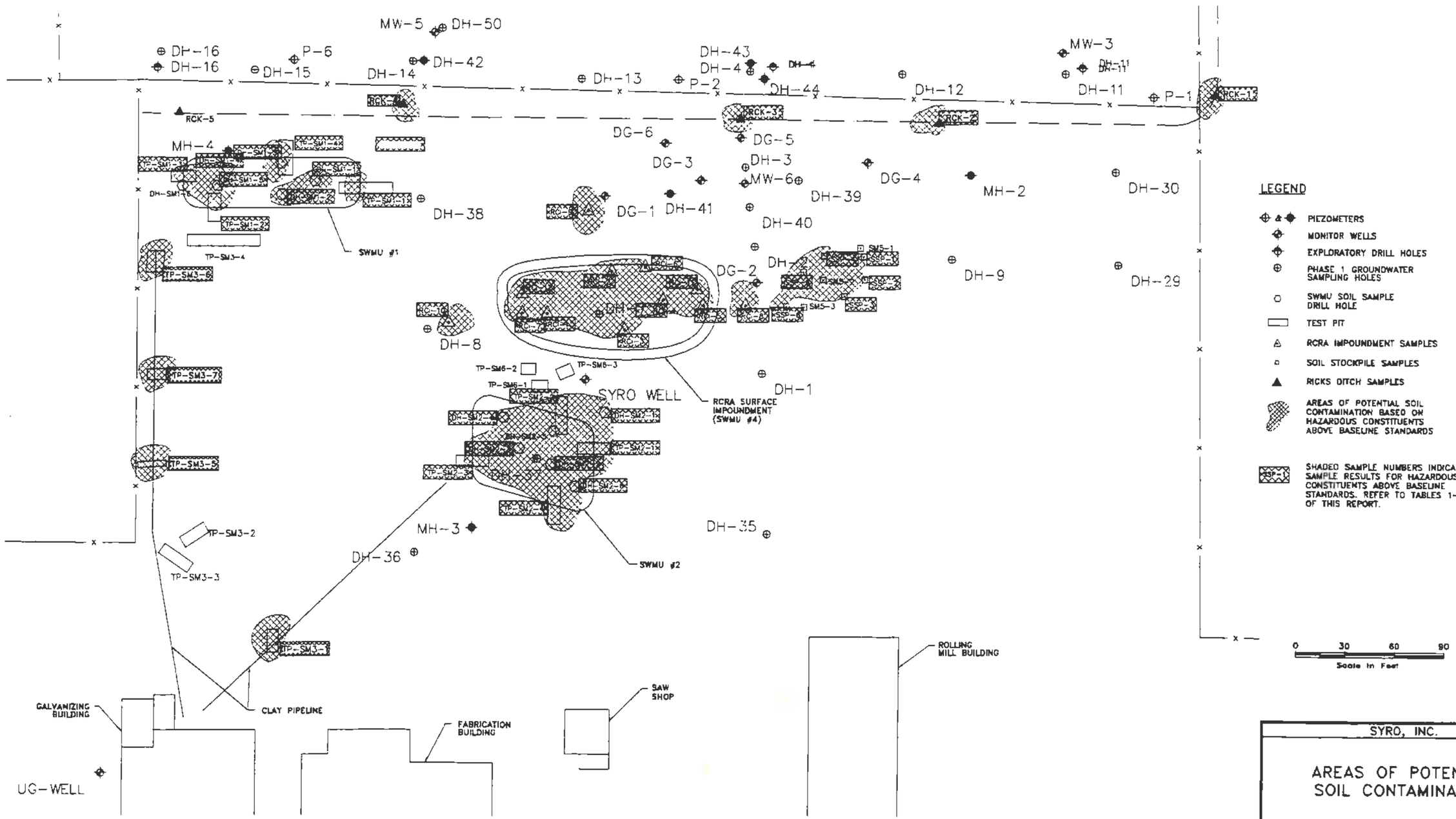
HYDROGEOLOGIC CROSS SECTION C-C'

BINGHAM ENVIRONMENTAL
SALT LAKE CITY - (801) 532-2230

FIGURE 13

Date JUNE 1994 | Proj. # 1104-007 | TM

12/13/1994 F:\PROJ\1104\CAD\1104POTE



Rev.	By	Date	Remarks
2	MT	12/13/94	UPDATE SHADED AREAS
1	MT	6/14/94	ADD CLAY PIPLINE & TEST PITS

SYRO, INC.

AREAS OF POTENTIAL SOIL CONTAMINATION

BINGHAM ENVIRONMENTAL
SALT LAKE CITY - (801) 532-2230

FIGURE 14

Date JUNE 1994 | Proj. # 1104-007 | JSR

600 W.

CHILD LANE

PORTER LANE

COMMERCIAL BUILDINGS

DH-46 DH-47 DH-48 DH-34 P-10 DH-32 DH-33 DH-31 OS-1 DH-23 DH-27 DH-28 P-5 DH-49 MW-1 P-4 4222 4223 DH-26 DH-25 DH-24 DH-45 P-9 DH-51 P-7 MW-4 P-8 DH-22 DH-21 DH-20 DH-6 MW-2 DH-19 P-3 4224 DH-18 DH-17 RICKS DITCH DH-10 MW-5 DH-50 DH-16 DH-16 DH-15 P-6 DH-14 DH-42 DH-43 DH-4 DH-4 DH-44 DH-13 P-2 DH-12 MW-3 DH-11 DH-11 P-1 4225 DG-6 DG-5 DG-3 DH-3 MW-6 DG-4 MH-2 DH-30 MH-4 DH-38 DG-1 DH-41 DH-39 DH-40 4226 DG-2 DH-2 DH-8 DH-29 SWMU #1 DH-7 4227 DH-5 DH-1 SYRO WELL 4228 RCRA SURFACE IMPOUNDMENT DH-37 4229 MH-3 DH-35 DH-36 SWMU #2 4230 4231 CLAY PIPELINE 4232 4233 GALVANIZING BUILDING FABRICATION BUILDING ROLLING MILL BUILDING 4234 UG-WELL

LEGEND

- PIEZOMETERS
- MONITOR WELLS
- EXPLORATORY DRILL HOLES
- PHASE 1 GROUNDWATER SAMPLING HOLES
- 4222 — GROUNDWATER CONTOURS

0 50 100 150

Scale in Feet

SYRO STEEL COMPANY

GROUNDWATER CONTOUR MAP

(DECEMBER 2, 1991)

BINGHAM ENVIRONMENTAL
SALT LAKE CITY - (801) 532-2230

FIGURE 15A

Rev.	By	Date	Remarks	Date MAY 1991	Proj. # 1104-007	T.M. 1104GW

06/16/1994 F:\PROJ\1104\CAD\1104GW1A

CHILD LANE

PORTER LANE

COMMERCIAL BUILDINGS

(4220.30) P-10

(4220.70) MW-7

RICKS DITCH

(4221.58) P-5

MW-1 (4220.79)

P-4

DH-45

P-9

(4223.53) P-7

(4222.47) MW-4

P-8

MW-2 (4223.87)

P-3

MW-5 (4226.62)

P-6 (4227.87)

DH-42 (4227.19)

(4225.92) P-2

DH-43

DH-44

RICKS DITCH

(4223.20) MW-3

P-1 (4223.40)

MH-4

DG-6 (AB)

DG-5 (AB)

(4224.90)

DG-4

(4224.61) MH-2

DG-1 (AB)

(4225.38) MW-6

DG-3 (AB)

DH-41 (4226.64)

SWMU #1

DG-2 (AB)

RCRA SURFACE IMPOUNDMENT

SYRO WELL (AB)

SWMU #2

(4232.59) MH-3

OFFICE TRAILER

MAIN OFFICE

STORAGE TRAILER

SHIPPING BUILDING

OFFICE TRAILER

SAW SHOP

(4233.42) UG-1

GALVANIZING BUILDING

FABRICATING BUILDING

ROLLING MILL BUILDING

UP&L POWER SUBSTAION

MH-5

MW-8 (4237.50)

(4234.10) MH-1

4222.00 4224.00 4225.00 4226.00 4230.00 4232.00 4234.00 4235.00 4236.00

LEGEND

- ⊕ & ◆ PIEZOMETERS
- ⊕ MONITOR WELLS INCLUDED IN NETWORK
- ⊕ (AB) MONITOR WELLS ABANDONED (APRIL 1994)
- 4222 GROUNDWATER CONTOURS

0 60 120 180

Scale in Feet

SYRO, INC.

GROUNDWATER CONTOUR MAP

(JUNE 6, 1994)

BINGHAM ENVIRONMENTAL
SALT LAKE CITY - (801) 532-2230

FIGURE 15B

Rev.	By	Date	Remarks	Date JUNE 1994	Proj # 1104-007	TM

600 W.

CHILD LANE

PORTER LANE

COMMERCIAL BUILDINGS

DH-46 DH-47 DH-48 DH-34 P-10 DH-32 DH-33 OS-1 DH-23 DH-27 DH-28 DH-31 P-5 DH-49 MW-1 P-4 DH-26 DH-25 DH-24 DH-45 P-9 DH-51 P-7 MW-4 P-8 DH-22 DH-21 DH-20 DH-6 MW-2 DH-19 P-3 DH-18 DH-17 RICKS DITCH MW-5 DH-50 DH-16 DH-16 DH-15 P-6 DH-14 DH-42 DH-13 P-2 DH-43 DH-44 DH-4 DH-34 DH-32 MW-3 DH-11 DH-11 P-1 DH-10 DG-6 DG-5 DG-3 DG-4 DH-39 DH-9 DH-30 MH-4 DH-38 DG-1 DH-41 DH-40 DG-2 DH-37 DH-9 DH-29 SWMU #1 DH-7 DH-8 SYRO WELL DH-1 RCRA SURFACE IMPOUNDMENT DH-37 DH-35 MH-3 DH-36 SWMU #2

8000 6000 4000 2000 4000 2000 4000

CLAY PIPELINE

GALVANIZING BUILDING

UG-WELL

FABRICATION BUILDING

ROLLING MILL BUILDING

LEGEND

- PIEZOMETERS
- MONITOR WELLS
- EXPLORATORY DRILL HOLES
- PHASE 1 GROUNDWATER SAMPLING HOLES
- 4000 SPECIFIC CONDUCTANCE CONTOUR (BASED ON MEASUREMENTS IN 1991)

0 50 100 150

Scale in Feet

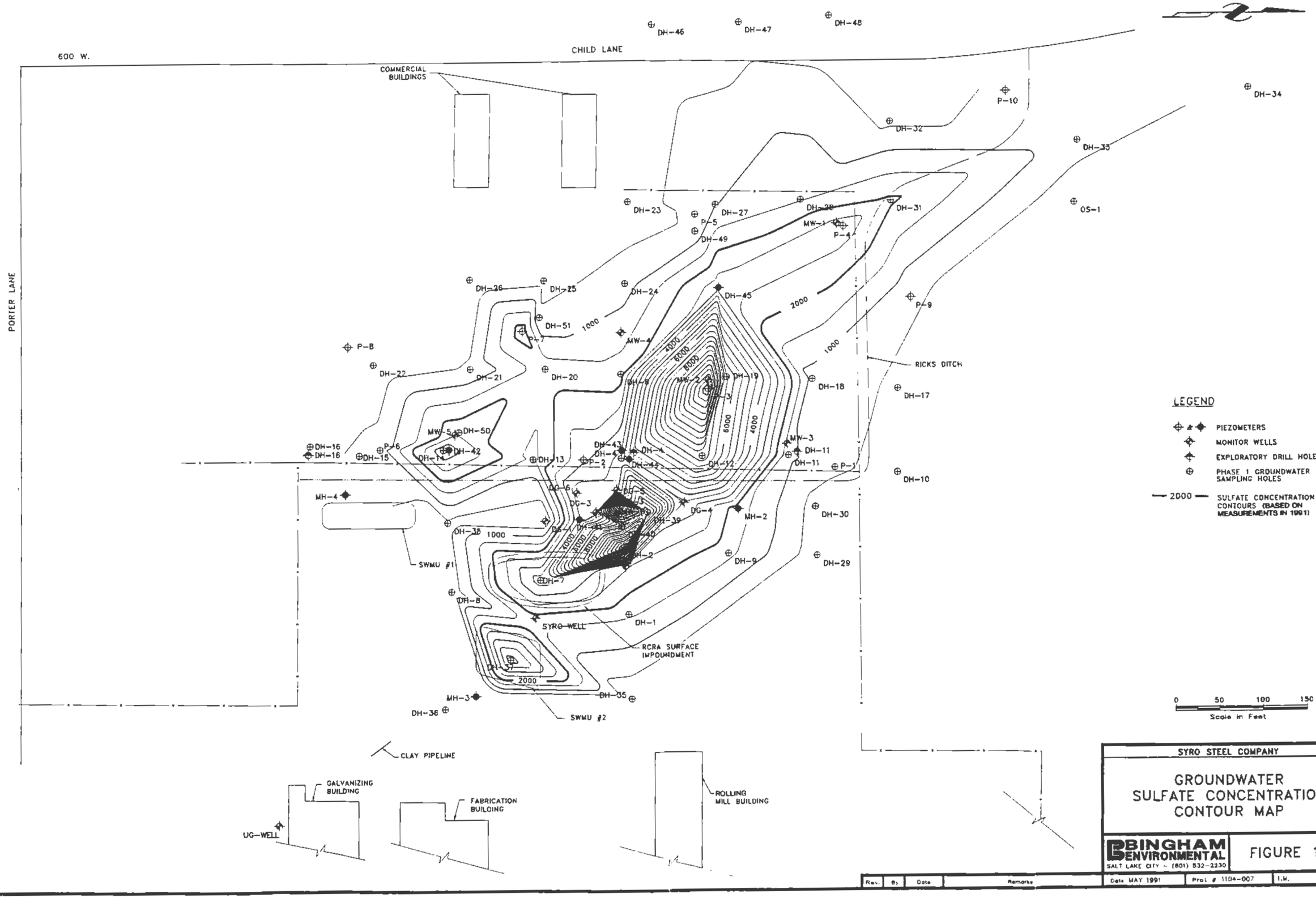
SYRO STEEL COMPANY

GROUNDWATER SPECIFIC CONDUCTANCE CONTOUR MAP

BINGHAM ENVIRONMENTAL
SALT LAKE CITY - (801) 532-2230

FIGURE 16

Rev.	By	Date	Remarks	Date MAY 1991	Proj # 1104-007	T.M. 1104COND



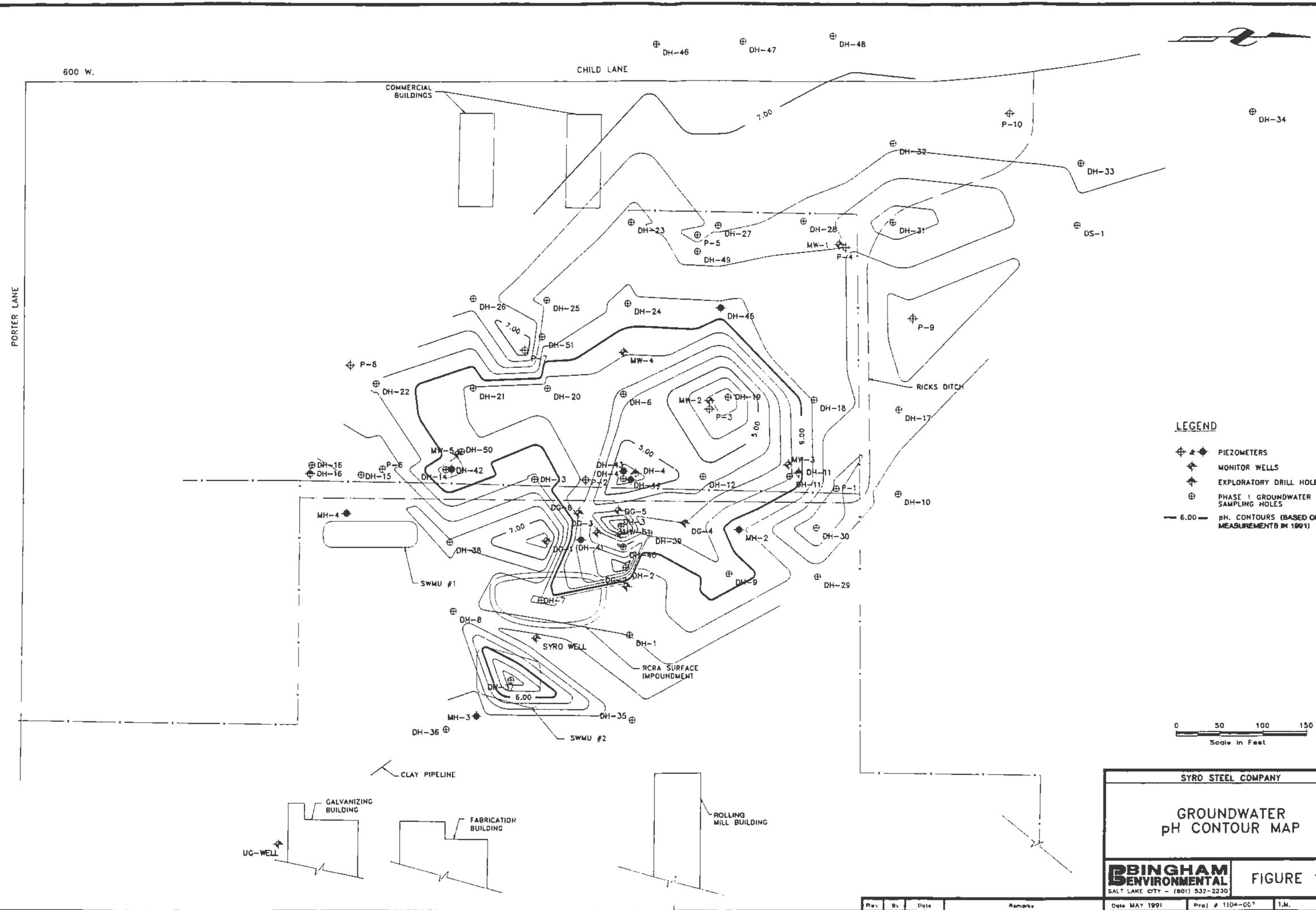
SYRO STEEL COMPANY

GROUNDWATER SULFATE CONCENTRATION CONTOUR MAP

BINGHAM ENVIRONMENTAL
SALT LAKE CITY - (801) 532-2230

FIGURE 17

Rev.	By	Date	Remarks	Date MAY 1991	Proj. # 1104-007	I.M. 1104SULF



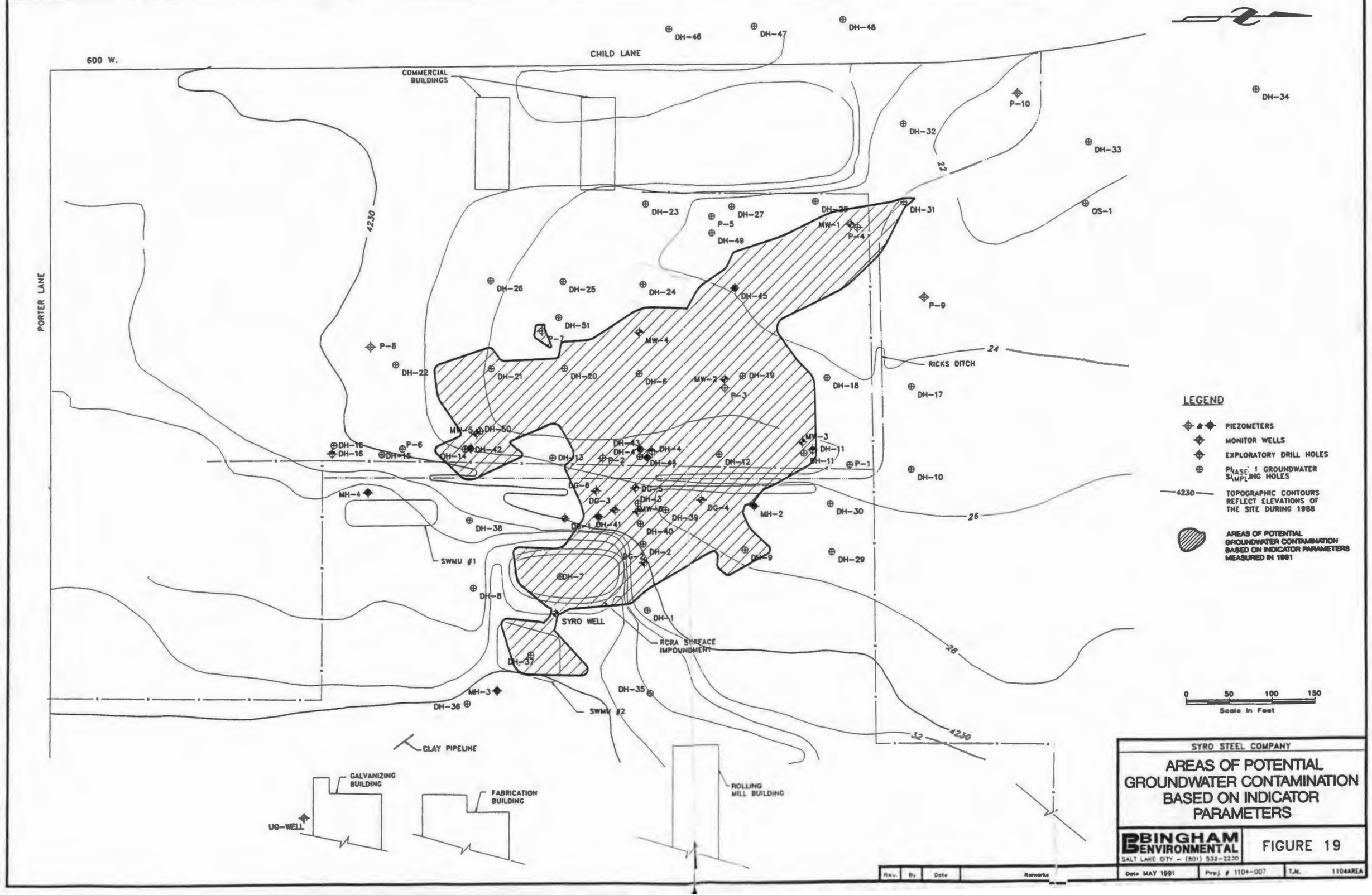
SYRO STEEL COMPANY

GROUNDWATER pH CONTOUR MAP

BINGHAM ENVIRONMENTAL
SALT LAKE CITY - (801) 532-2230

FIGURE 18

Rev	By	Date	Remarks	Date MAY 1991	Proj # 1104-007	I.M. 1104PH



SYRO STEEL COMPANY

AREAS OF POTENTIAL GROUNDWATER CONTAMINATION BASED ON INDICATOR PARAMETERS

BINGHAM ENVIRONMENTAL
SALT LAKE CITY – (801) 532-2230

FIGURE 19

Rev.	By	Date	Remarks	Date MAY 1991	Proj. # 1104-007	T.M. 1104AREA

SYRO STEEL COMPANY

Potentiometric Head vs. Well Depth

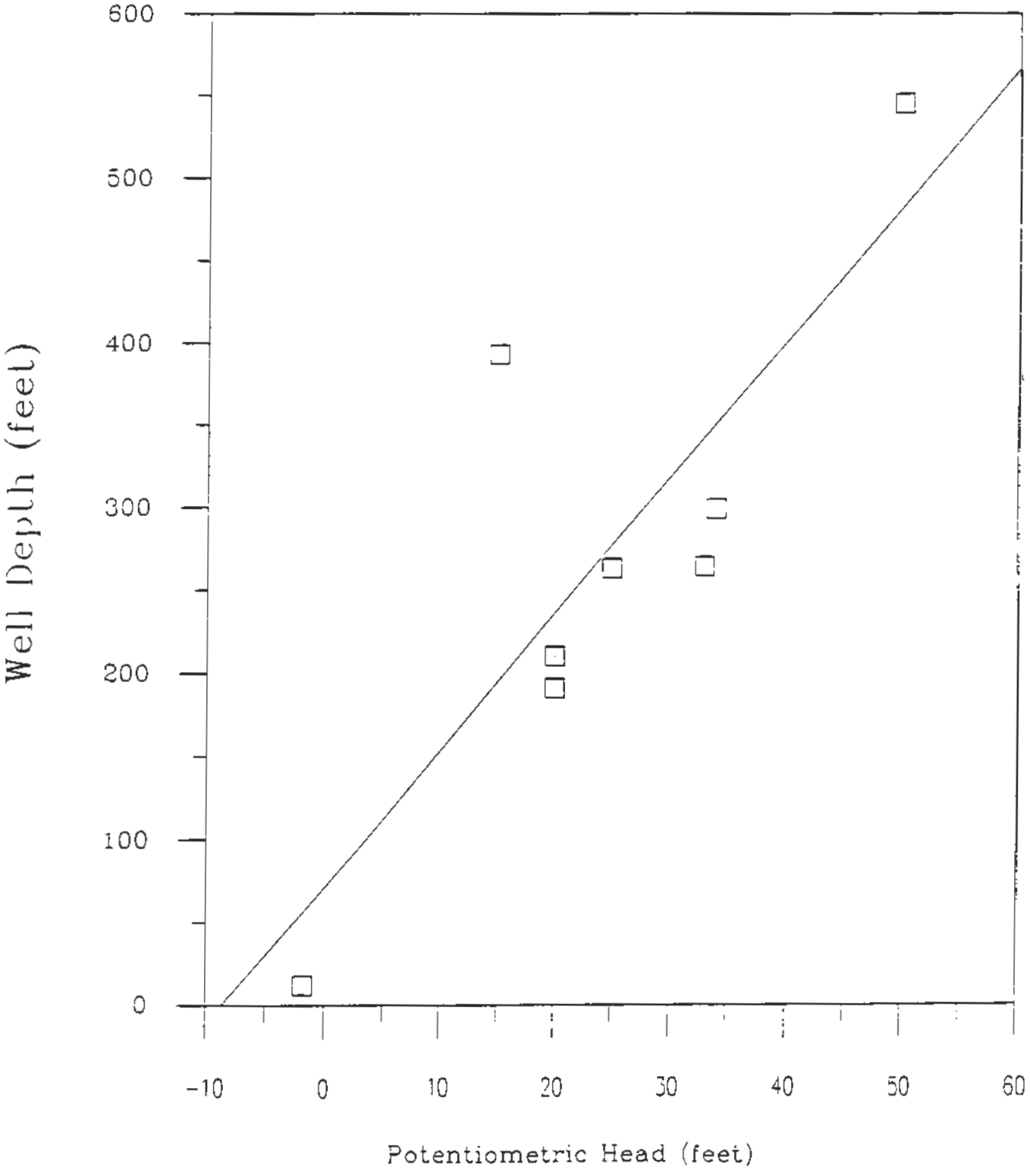


FIGURE 20

APPENDIX A

FIELD PROGRAM

The Information on Pages A-1 Through A-7 Were Removed From Appendix A and Incorporated in Section 3.0 of the Text.

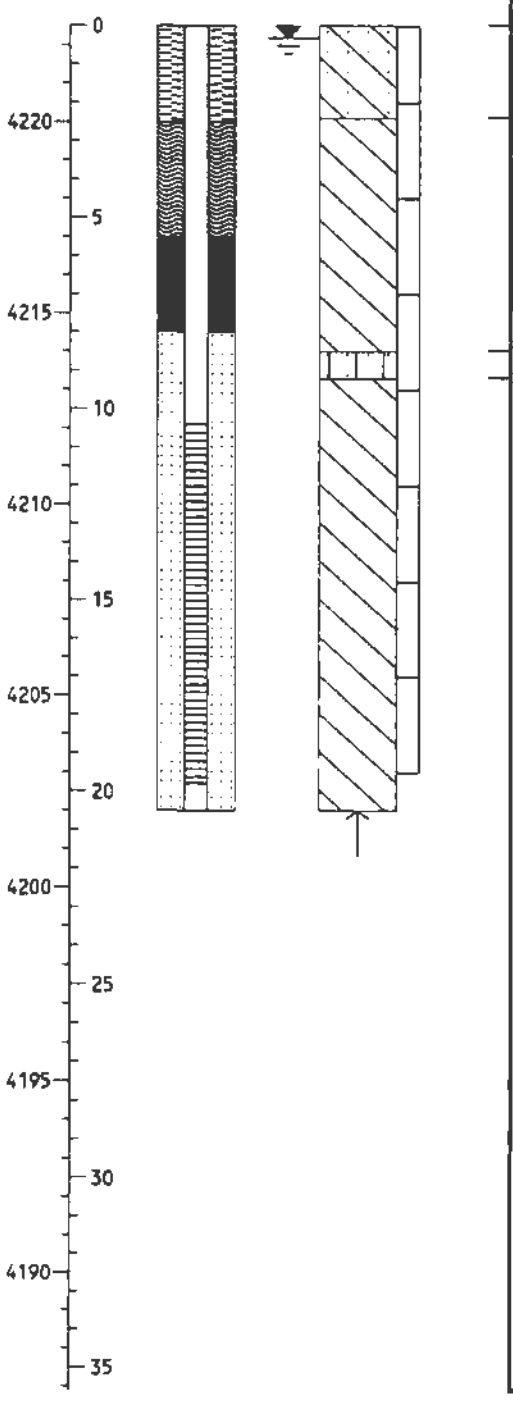
The Page Numbering in Appendix A Will Commence With A-8.

DRILL HOLE LOGS
AND
MONITOR WELL COMPLETION DETAILS

DRILL HOLE LOG
DRILL HOLE NO.: MW-1

PROJECT: Syro RFI
CLIENT/OWNER: Syro Steel Company
HOLE LOCATION: Approximately 10 ft South of P-4
DRILLER: Overland Drilling, Inc.
DRILL RIG: CME 750
DEPTH TO WATER: 0.3' HOLE DIAMETER: 7.75"

PROJECT NO.: 1104
DATE: 11-19-91
TOC ELEV.: 4224.46
GS ELEV.: 4222.5
LOGGED BY: DCH
HOLE NO.: MW-1



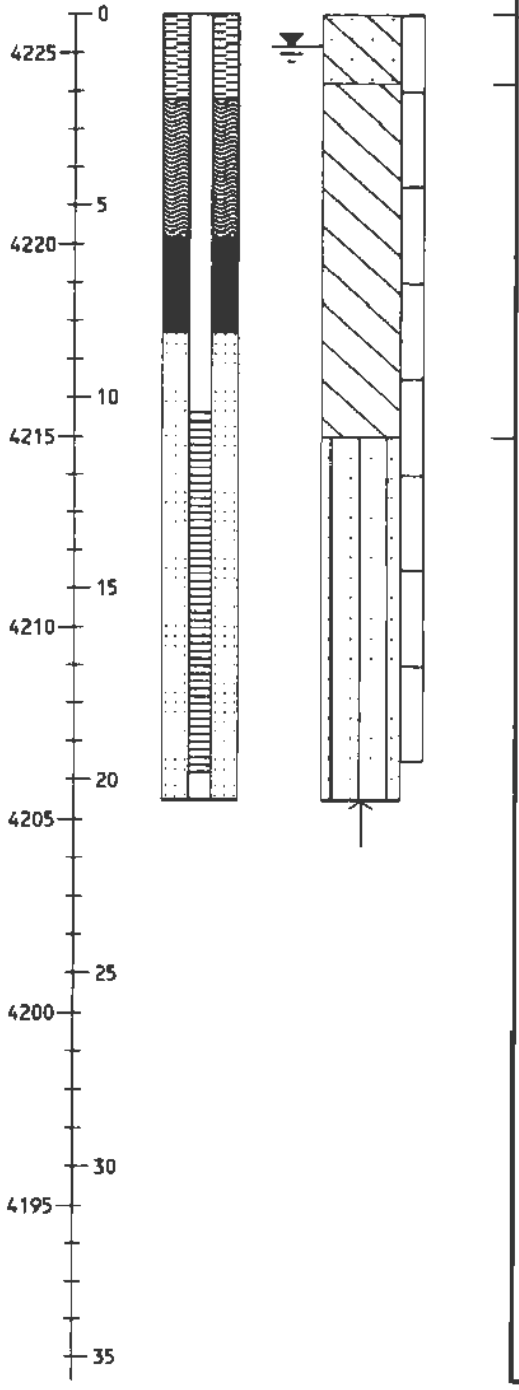
USCS	Description	Sample Number	Sample Depth (ft)	Recovery (in/in)
CL	SANDY CLAY: Dark gray to black, fine, with some silt, mica, roots, moist.	L-1	0-2	8
CL	SILTY CLAY: Greenish gray with iron oxide staining, sandy, fine, moist.	L-2	2-4.5	30
		L-3	4.5-7	30
	...sand lense, 1" thick, wet.	L-4	7-9.5	30
SM	SILTY SAND: Greenish gray, clayey, fine, wet.	L-5	9.5-12	30
CL	SILTY CLAY: Greenish gray, slightly sandy, fine, silty, wet.	L-6	12-14.5	30
		L-7	14.5-17	30
	... grades to gray.			
	... clayey sand lenses.	L-8	17-19.5	30
	... sand lense, 2" thick. ... sand lense, 1" thick.			

Well completed using 2-inch diameter PVC pipe.

DRILL HOLE LOG
DRILL HOLE NO.: MW-2

PROJECT: Syro RFI
CLIENT/OWNER: Syro Steel Company
HOLE LOCATION: Near DH-19
DRILLER: Overland Drilling, Inc.
DRILL RIG: CME 750
DEPTH TO WATER: 0.8' HOLE DIAMETER: 7.75"

PROJECT NO.: 1104
DATE: 11-20-91
TOC ELEV.: 4227.56
GS ELEV.: 4226.0
LOGGED BY: DCH
HOLE NO.: MW-2



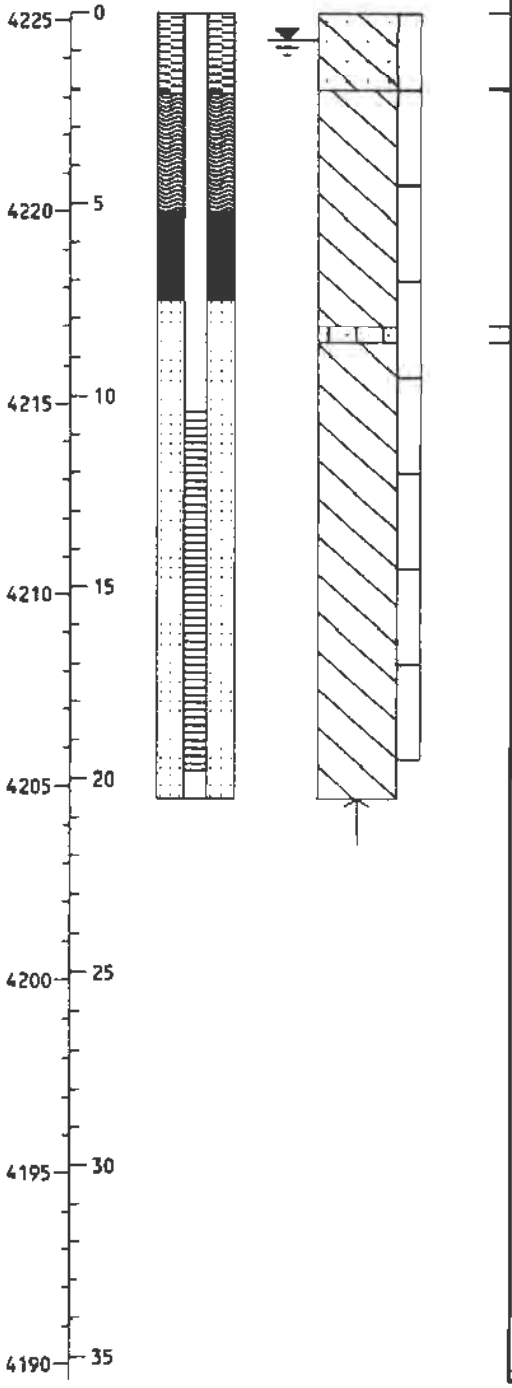
USCS	Description	Sample Number	Sample Depth (ft)	Recovery (in/in)
CL	SANDY CLAY: Dark gray to black, fine to coarse, with some silt, mica, roots, moist.	L-1	0-2	16
CL	SILTY CLAY: Grayish tan with iron oxide staining, sandy, fine, roots, moist.	L-2	2-4.5	30
	... grades to greenish gray.	L-3	4.5-7	30
	... sand lense, 1" thick, at 5.3' and 6.0'.	L-4	7-9.5	30
	... sand lense, 1.5" thick. ... sand lense, 1" thick, at 8.6' and 9.1'.	L-5	9.5-12	30
SM	SILTY SAND: Greenish gray, fine, trace of gravel, roots, wet.	L-6	12-14.5	30
	...grades to less silty.	L-7	14.5-17	30
	... grades to a darker greenish gray.	L-8	17-19.5	30

Well completed using 2-inch diameter PVC pipe.

DRILL HOLE LOG
DRILL HOLE NO.: MW-3

PROJECT: Syro RFI
CLIENT/OWNER: Syro Steel Company
HOLE LOCATION: Approximately 10 ft West of DH-11.
DRILLER: Overland Drilling, Inc.
DRILL RIG: CME 750
DEPTH TO WATER: 0.7' HOLE DIAMETER: 7.75"

PROJECT NO.: 1104
DATE: 11-20-91
TOC ELEV.: 4227.01
GS ELEV.: 4225.2
LOGGED BY: DCH
HOLE NO.: MW-3



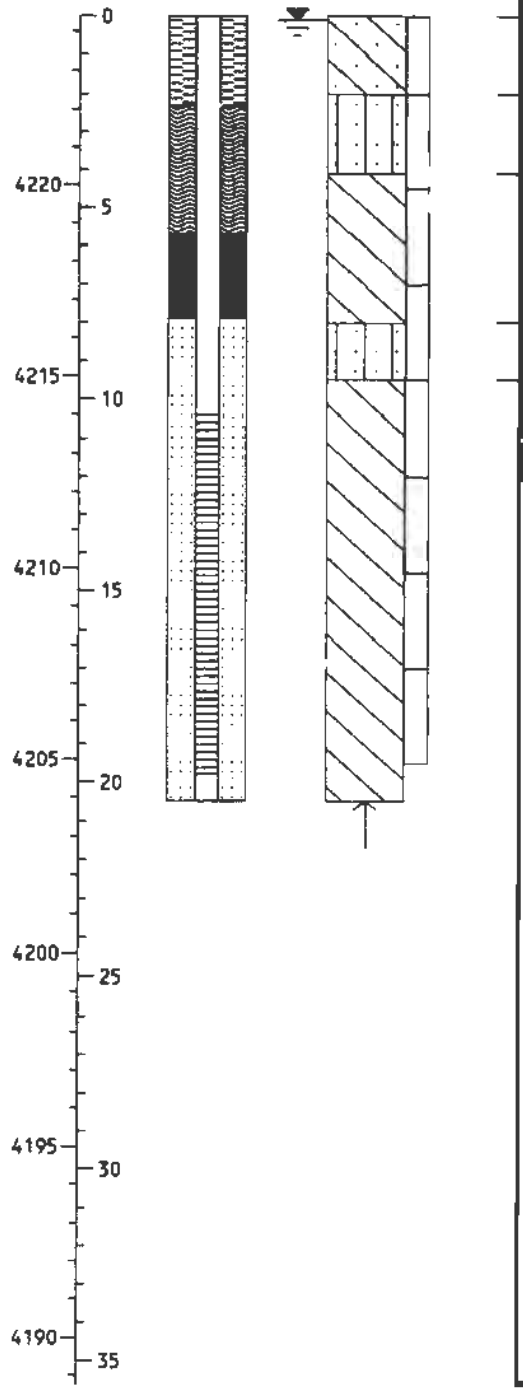
ELEVATION / DEPTH	WELL DETAILS	SOIL SYMBOLS, SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)	Recovery (in/in)
			SC	CLAYEY SAND: Dark gray to black, fine, with some silt, mica, roots, moist.	L-1	0-2	10
			CL	SILTY CLAY: Greenish gray with iron oxide staining, sandy, fine, roots, moist. Occasional thin sand lenses, moist.	L-2	2-4.5	30
					L-3	4.5-7	30
					L-4	7-9.5	30
			SM	SILTY SAND: Greenish gray, fine, wet.			
			CL	SILTY CLAY: Greenish gray, iron oxide staining, sandy, roots, moist. Occasional thin sand lenses, moist. thick, wet.	L-5	9.5-12	30
					L-6	12-14.5	30
					L-7	14.5-17	30
					L-8	17-19.5	30

Well completed using 2-inch diameter PVC pipe.

DRILL HOLE LOG
DRILL HOLE NO.: MW-4

PROJECT: Syro RFI
CLIENT/OWNER: Syro Steel Company
HOLE LOCATION: Between DH-6 and DH-24
DRILLER: Overland Drilling, Inc.
DRILL RIG: CME 750
DEPTH TO WATER: 0.1'
HOLE DIAMETER: 7.75"

PROJECT NO.: 1104
DATE: 11-21-91
TOC ELEV.: 4226.30
GS ELEV.: 4224.4
LOGGED BY: DCH
HOLE NO.: MW-4



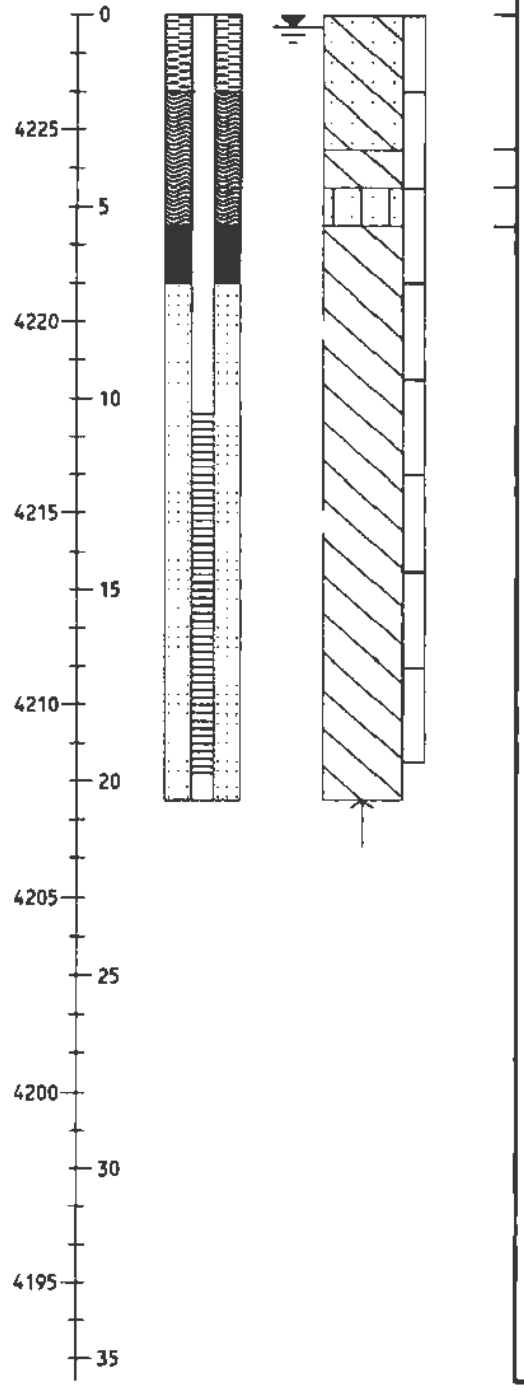
USCS	Description	Sample Number	Sample Depth (ft)	Recovery (in/in)
CL	SANDY CLAY: Dark gray to black, fine to coarse, with some silt, mica, roots, moist.	L-1	0-2	24
SM	SILTY SAND: Greenish gray, fine to medium, roots, moist.	L-2	2-4.5	0
CL	SILTY CLAY: Greenish gray with iron oxide staining, sandy, fine, roots, occasional sand lenses, moist.	L-3	4.5-7	8
		L-4	7-9.5	30
SM	SILTY SAND: Greenish gray, fine to medium, wet.			
CL	SILTY CLAY: Greenish gray with iron oxide staining, sandy, fine, occasional sand lenses, roots, moist.	L-5	9.5-12	30
		L-6	12-14.5	30
		L-7	14.5-17	30
		L-8	17-19.5	30

Well completed using 2-inch diameter PVC pipe.

DRILL HOLE LOG
DRILL HOLE NO.: MW-5

PROJECT: Syro RFI
CLIENT/OWNER: Syro Steel Company
HOLE LOCATION: Approximately 20 ft West of DH-42
DRILLER: Overland Drilling, Inc.
DRILL RIG: CME 750
DEPTH TO WATER: 0.3' HOLE DIAMETER: 7.75"

PROJECT NO.: 1104
DATE: 11-21-91
TOC ELEV.: 4229.82
GS ELEV.: 4228.0
LOGGED BY: DCH
HOLE NO.: MW-5



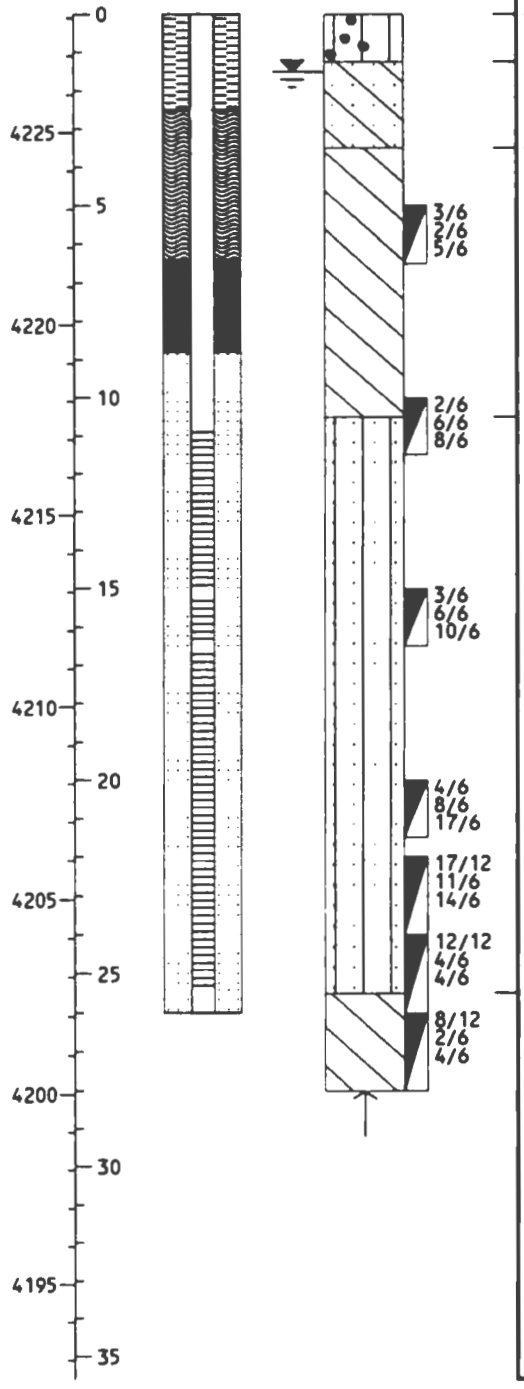
ELEVATION / DEPTH	WELL DETAILS	SOIL SYMBOLS, SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)	Recovery (in/in)
			CL	SANDY CLAY: Black, fine, with some silt, roots, iron oxide staining, moist.	L-1	0-2	22
					L-2	2-4.5	30
			CL	SILTY CLAY: Gray, iron oxide staining, moist.	L-3	4.5-7	30
			SM	SILTY SAND: Gray, fine to medium, wet.			
			CL	SILTY CLAY: Greenish gray, iron oxide staining, occasional fine sand lenses, roots, moist.	L-4	7-9.5	30
					L-5	9.5-12	30
					L-6	12-14.5	30
					L-7	14.5-17	30
				... grades to gray.	L-8	17-19.5	30

Well completed using 2-inch diameter PVC pipe.

DRILL HOLE LOG
DRILL HOLE NO.: MW-6

PROJECT: Syro RFI
CLIENT/OWNER: Syro Steel Company
HOLE LOCATION: North-West of RCRA surface impoundment.
DRILLER: Overland Drilling, Inc.
DRILL RIG: CME 750
DEPTH TO WATER: 1.5' HOLE DIAMETER: 10.0"

PROJECT NO.: 1104
DATE: 11-22-91
TOC ELEV.: 4229.57
GS ELEV.: 4228.1
LOGGED BY: DCH
HOLE NO.: MW-6



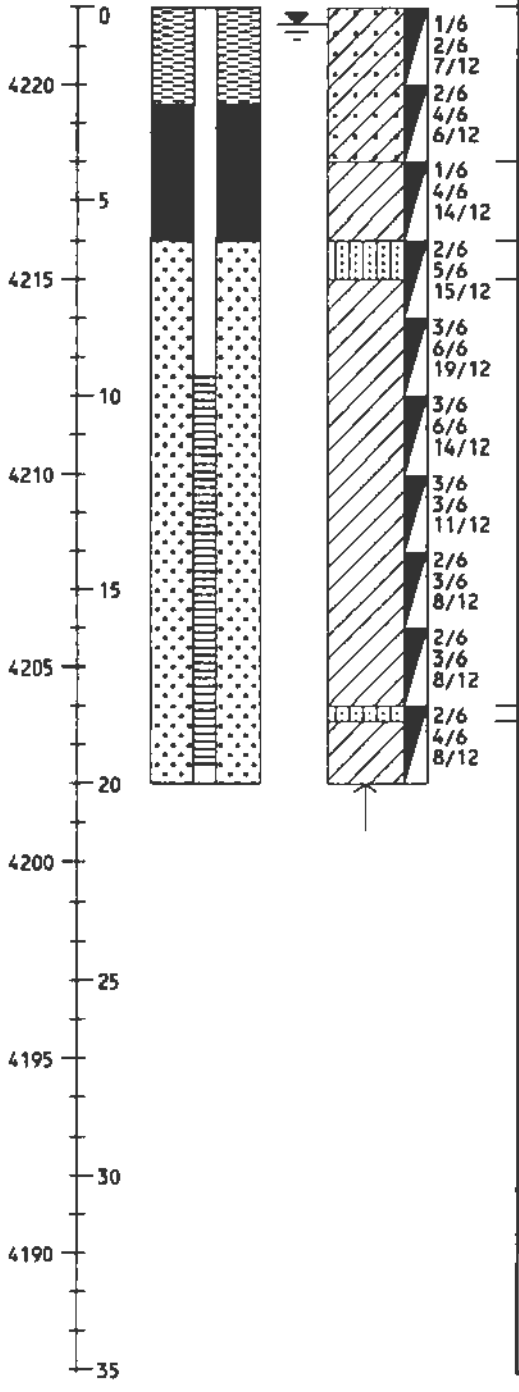
ELEVATION / DEPTH	WELL DETAILS	SOIL SYMBOLS, SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)	Recovery (in/in)
			GM	FILL: Gray and brown, gravelly, silty, sandy, moist.			
			CL	SANDYCLAY: Dark gray to black, fine to coarse, with some silt, roots, moist.			
			CL	SILTY CLAY: Greenish gray with iron oxide staining, sandy, fine, roots, moist.	B-1	5-6.5	0
			SM	SILTY SAND: Greenish gray with iron oxide staining, fine to medium, roots, wet.	B-2	10-11.5	12
				...grades to trace of roots.	B-3	15-16.5	18
					B-4	20-21.5	18
				... grades to gray.	B-5	22-24	24
					B-6	24-26	24
			CL	CLAY: Gray, slightly sandy, fine, moist.	B-7	26-28	24

Well completed using 4-inch diameter PVC pipe.

DRILL HOLE LOG
DRILL HOLE NO.: MW-7

PROJECT: Syro RFI
CLIENT/OWNER: Syro,Inc.
HOLE LOCATION: Northwest of MW-1
DRILLER: Overland Drilling Company
DRILL RIG: CME 75
DEPTH TO WATER: .42' HOLE DIAMETER: 8.25"

PROJECT NO.: 1104-008
DATE: 4-18-94
TOC ELEV.: 4224.58
GS ELEV.: 4222.0
LOGGED BY: DH
HOLE NO.: MW-7

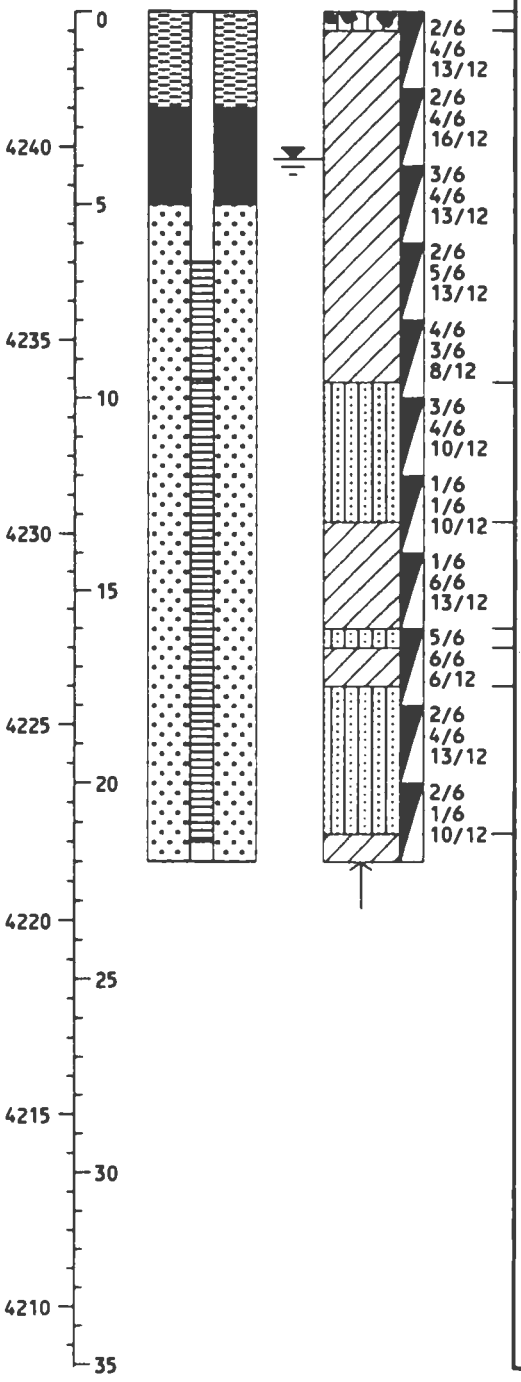


USCS	Description	Sample Number	Sample Depth (ft)	Recovery (in/in)
CL	SANDY CLAY: Black to dark gray, fine to coarse, slighltly silty, stiff, moist.	B-1	0-2	24/24
		B-2	2-4	12/24
CL	SILTY CLAY: Greenish gray, iron oxide staining, slightly sandy, stiff, moist. 3-inch sand lense at 5.5 feet.	B-3	4-6	16/24
SM	SILTY SAND: Greenish gray, fine to medium, loose, wet.	B-4	6-8	24/24
CL	SILTY CLAY: Greenish gray, iron oxide stainning, stiff, very moist to wet.	B-5	8-10	24/24
		B-6	10-12	24/24
		B-7	12-14	12/24
		B-8	14-16	24/24
		B-9	16-18	24/24
SM	SILTY SAND: Gray, fine to medium, loose, wet.	B-10	18-20	24/24
CL	SILTY CLAY: Greenish gray, stiff, wet.			

DRILL HOLE LOG
DRILL HOLE NO.: MW-8

PROJECT: Syro RFI
CLIENT/OWNER: Syro,Inc.
HOLE LOCATION: Southeast corner of Syro property
DRILLER: Overland Drilling Company
DRILL RIG: CME 75
DEPTH TO WATER: 3.82' HOLE DIAMETER: 8.25"

PROJECT NO.: 1104-008
DATE: 4-18-94
TOC ELEV.: 4245.68
GS ELEV.: 4243.5
LOGGED BY: DH
HOLE NO.: MW-8

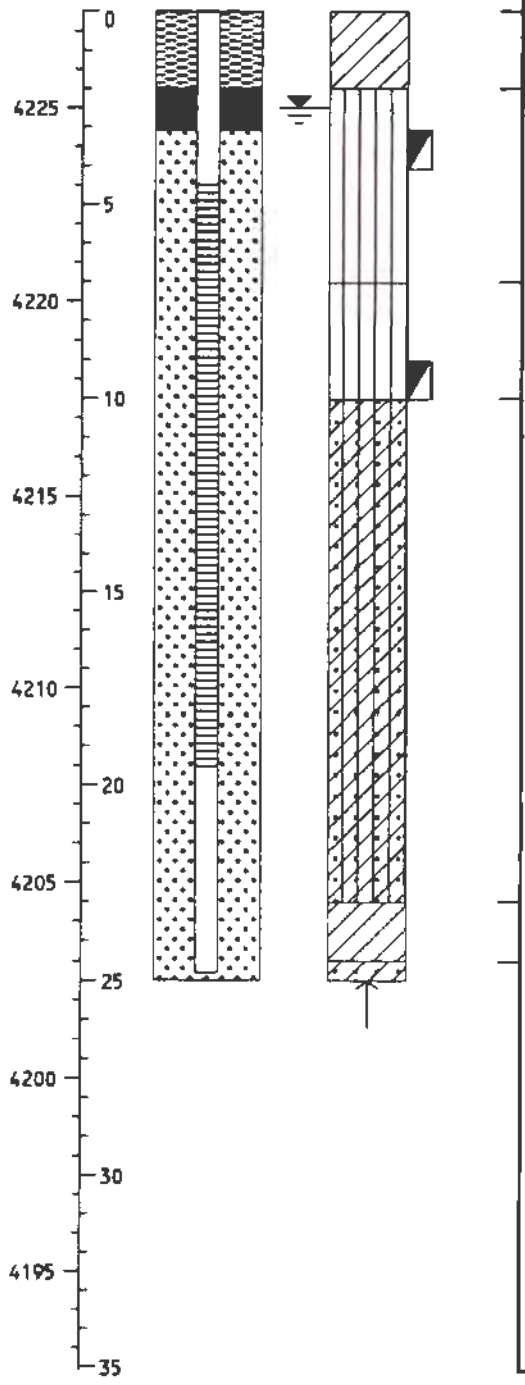


USCS	Description	Sample Number	Sample Depth (ft)	Recovery (in/in)
GM	SILTY GRAVEL: Gray and brown, sandy, moist (Fill).	B-1	0-2	2/24
CL	SILTY CLAY: Gray to greenish gray, sandy, fine, roots, medium stiff to stiff, moist to wet.	B-2	2-4	12/24
		B-3	4-6	16/24
	...occasional silty sand lenses	B-4	6-8	24/24
	...grades wet.	B-5	8-10	24/24
SM	SITLY SAND: Greenish gray, fine to medium, loose, wet.	B-6	10-12	24/24
		B-7	12-14	10/24
CL	SILTY CLAY: Brown to greenish gray, stiff, very moist.	B-8	14-16	24/24
SM	SILTY SAND: Brown, fine, very loose, wet.	B-9	16-18	24/24
CL	SILTY CLAY: gray, medium stiff, wet.			
SM	SILTY SAND: Gray, fine to coarse, loose to medium dense, wet.	B-10	18-20	14/24
		B-11	20-22	20/24
CL	SILTY CLAY: Dark gray, stiff, wet.			

DRILL HOLE LOG
DRILL HOLE NO.: DG-4

PROJECT: RCRA Facility
CLIENT/OWNER: Syro, Inc.
HOLE LOCATION: Northwest of RCRA Impoundment
DRILLER: Mountain States Drilling
DRILL RIG: CME 55
DEPTH TO WATER: 2.5' HOLE DIAMETER: 7.5"

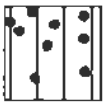
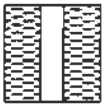
PROJECT NO.: 1104-011
DATE: 5/22/84
TOC ELEV.: 4228.02
GS ELEV.: 4227.5
LOGGED BY: MHS
HOLE NO.: DG-4

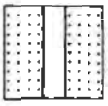
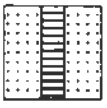


USCS	Description	Sample Number	Sample Depth (ft)	Recovery (in/in)
CL	SILTY CLAY: Black, mod. plastic, soft, slightly moist.			
ML	CLAYEY SILT: Olive gray, slightly plastic, slightly stiff, saturated.		3-4	7/12
ML	CLAYEY SILT: Gray-green, slightly plastic, slightly stiff, saturated.		8-10	9/12
SM-SC	CLAYEY SANDY SILT: Gray-green, slightly plastic, slightly stiff to loose, saturated.			
CL	SILTY CLAY: Gray, slightly plastic, mod. stiff, saturated.			
SC	SANDY CLAY: Gray-green, stiff.			

This drill hole log and well completion details are taken directly from JMM drill hole log and well completion details for DG-4.

KEY TO SYMBOLS

Symbol	Description
Strata symbols	
	Silty gravel
	Silty sand
	Sandy clay
	Clay
Misc. Symbols	
	Drill hole completion depth
	Water table
Soil Samplers	
	Standard penetration test
	CME continuous sampler
Monitor Well Details	
	Locked cover set in concrete
	Bentonite slurry
	Bentonite pellets, blank PVC

Symbol	Description
	Silica sand, blank PVC
	Silica sand, slotted PVC

KEY TO SYMBOLS

Notes:

1. Monitor wells MW-1 through MW-6 were drilled 11/19/91 through 11/22/91. Piesometers DH-41 through DH-45 were drilled on 6/17/91 through 6/26/91. Exploratory drill holes DH-4, 11, 16 were drilled on 4/16/91 through 4/19/91. The monitor wells, piezometers and exploratory drill holes were drilled with a truck mounted drill rig using 7.25, 8.25, or 10-inch diameter continuous flight hollow stem auger.

2. MW-1 through MW-5 were completed using 2-inch diameter PVC pipe and MW-6 was completed using 4-inch diameter PVC pipe.

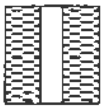
3. Soil samples for soil identification were collected using a standard split spoon sampler (SPT) and a CME continuous sampler.

4. Free water was encountered at the time of drilling at the levels shown on the drill hole logs.

5. Monitor well, piezometer, and exploratory drill hole locations were surveyed using existing Syro Datums.

6. These logs are subject to the limitations, conclusions, and recommendations in this report.

KEY TO SYMBOLS

Symbol	Description
Strata symbols	
	Sandy Clay
	Silty Clay
	Silty Sand
	Silty Gravel
Misc. Symbols	
	Water table
	Drill hole completion depth
Soil Samplers	
	Standard penetration test (SPT)
Monitor Well Details	
	Protective well cover set in concrete

Symbol	Description
	Bentonite pellets Blank 2" O.D. PVC pipe
	#16-40 silica sand Blank 2" O.D. PVC pipe
	#16-40 silica sand 10 slot 2" O.D. PVC pipe

Notes:

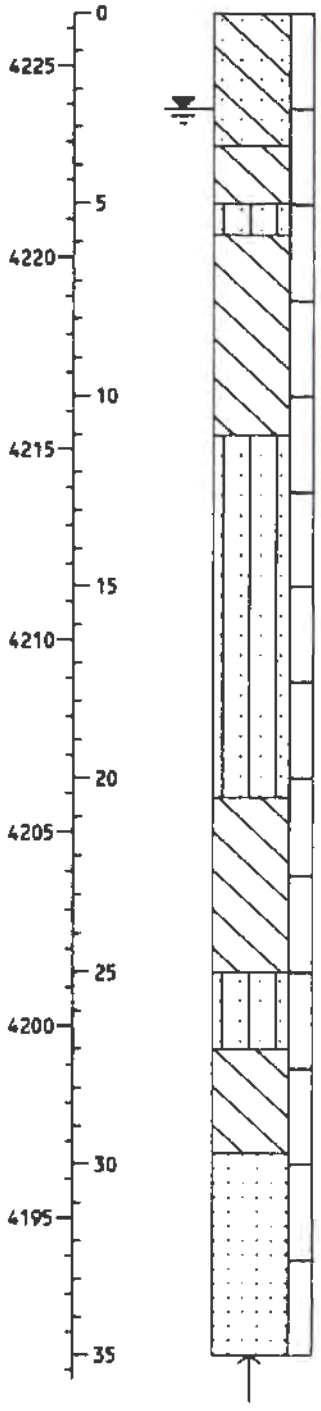
1. Monitor wells MW-7 and MW-8 were drilled and installed on April 18, 1994. The holes were drilled utilizing a truck mounted drill rig using 8.25-inch O.D. continuous flight hollow stem augers.
2. Soil samples for soil classification and identification were collected using a standard split spoon sampler.
3. Depths to water levels shown on the drill holes logs were measured on April 18, 1994
4. These logs are subject to the limitations, conclusions, and recommendations in this report.

EXPLORATORY DRILL HOLE LOGS

DRILL HOLE LOG
DRILL HOLE NO.: DH-4

PROJECT: Syro Steel RFI
CLIENT/OWNER: Syro Steel Company
HOLE LOCATION: NW of RCRA Impoundment
DRILLER: Bedke Drilling Company
DRILL RIG: Acker Soil Sentry
DEPTH TO WATER: 2.5 HOLE DIAMETER: 7.25"

PROJECT NO.: 1104-007
DATE: 4-19-91
TOC ELEV.: NA
GS ELEV.: 4226.4
LOGGED BY: DCH
HOLE NO.: DH-4



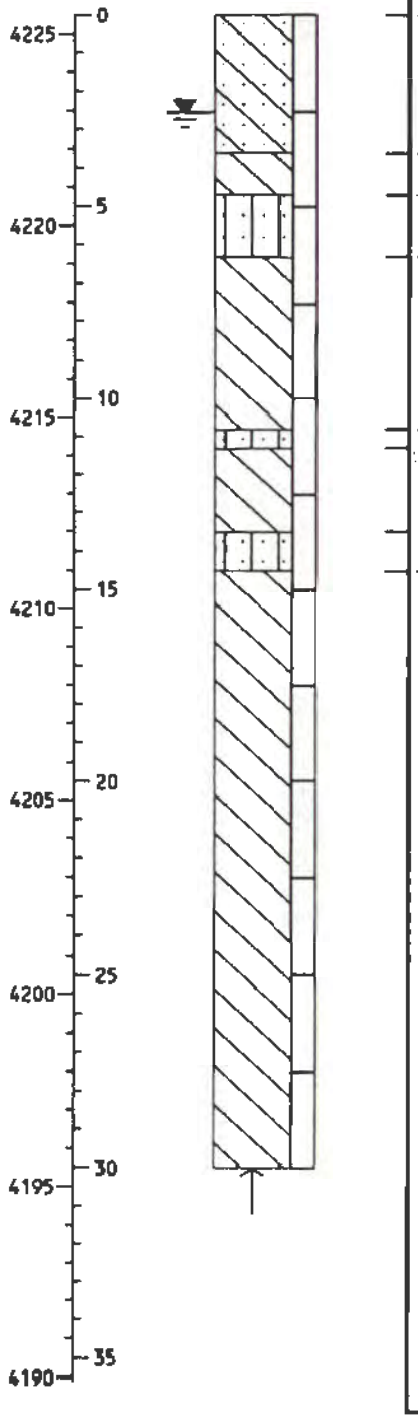
ELEVATION / DEPTH	USCS	Description	Sample Number	Sample Depth (ft)	Recovery (in/in)
	CL	SANDY CLAY: Black, fine, roots, mica, very moist.	L-1	0-2.5	24/30
			L-2	2.5-5	30/30
	CL	SILTY CLAY: Gray, slightly sandy, fine, with some silt, iron oxide staining, very moist.	L-3	5-7.5	28/30
	SM	SILTY SAND: Gray, fine to medium, wet.			
	CL	SILTY CLAY: Gray, slightly sandy and silty, iron oxide staining, wet.	L-4	7.5-10	30/30
			L-5	10-12.5	29/30
	SM	SILTY SAND: Dark gray, fine to coarse, wet.	L-6	12.5-15	30/30
			L-7	15-17.5	23/30
			L-8	17.5-20	30/30
			L-9	20-22.5	26/30
	CL	CLAY: Dark gray, slightly sandy, moist.	L-10	22.5-25	30/30
	SM	SILTY SAND: Dark gray, fine, wet.	L-11	25-27.5	30/30
	CL	CLAY: Dark gray, slightly sandy, moist.	L-12	27.5-30	30/30
	SP	SAND: Dark gray, fine to medium, wet	L-13	30-32.5	3/30
			L-14	32.5-35	24/30
		...grades to fine sand with occasional clay lenses.			

Drill hole backfilled with bentonite

DRILL HOLE LOG
DRILL HOLE NO.: DH-11

PROJECT: Syro Steel RFI
CLIENT/OWNER: Syro Steel Company
HOLE LOCATION:
DRILLER: Bedke Drilling Company
DRILL RIG: Acker Soil Sentry
DEPTH TO WATER: 2.5 HOLE DIAMETER: 7.25"

PROJECT NO.: 1104-007
DATE: 4-19-91
TOC ELEV.: NA
GS ELEV.: 4225.5
LOGGED BY: DCH
HOLE NO.: DH-11



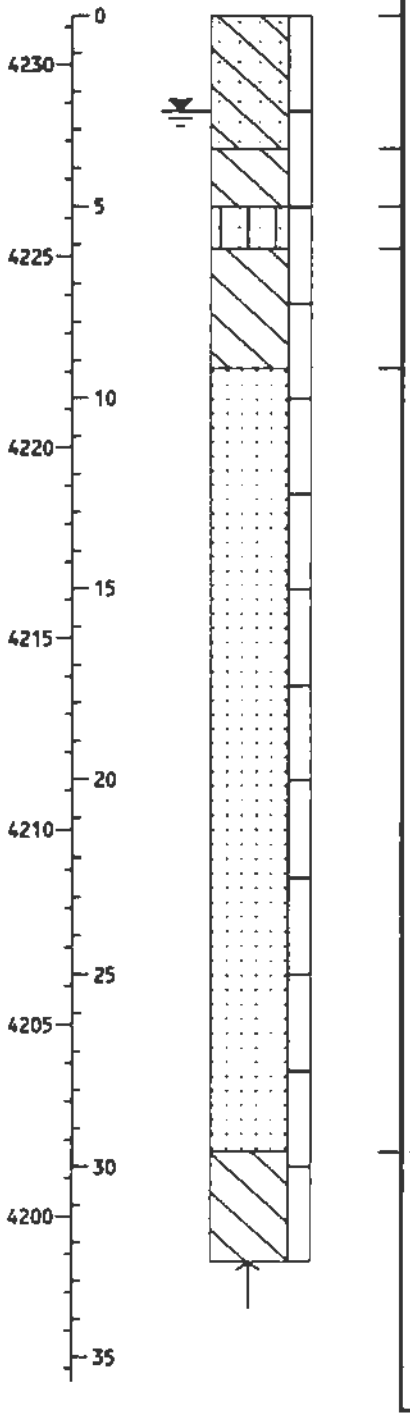
USCS	Description	Sample Number	Sample Depth (ft)	Recovery (in/in)
CL	SANDY CLAY: Black, sandy, fine, with some silt, roots, mica, moist.	L-1	0-2.5	28/30
	...grades to dark gray.	L-2	2.5-5	30/30
CL	SILTY CLAY: Brownish gray, slightly sandy, fine, iron oxide staining, moist.			
SM	SILTY SAND: Brownish gray, fine to medium, wet.	L-3	5-7.5	25/30
CL	SILTY CLAY: Brownish gray, slightly sandy, iron oxide staining, moist.	L-4	7.5-10	30/30
		L-5	10-12.5	30/30
SM	SILTY SAND: Gray, fine to medium, wet.			
CL	SILTY CLAY: Gray, iron oxide staining, moist.	L-6	12.5-15	30/30
SM	SILTY SAND: Gray, fine, wet.			
CL	CLAY: Gray, with occasional thin sand lenses. moist.	L-7	15-17.5	30/30
		L-8	17.5-20	30/30
		L-9	20-22.5	30/30
		L-10	22.5-25	30/30
	...grades to slightly sandy.	L-11	25-27.5	30/30
		L-12	27.5-30	30/30

Drill hole backfilled with bentonite

DRILL HOLE LOG
DRILL HOLE NO.: DH-16

PROJECT: Syro Steel RFI
CLIENT/OWNER: Syro Steel Company
HOLE LOCATION: West of SWMU 1
DRILLER: Bedke Drilling Company
DRILL RIG: Acker Soil Sentry
DEPTH TO WATER: 2.5 HOLE DIAMETER: 7.25"

PROJECT NO.: 1104-007
DATE: 4-27-91
TOC ELEV.: NA
GS ELEV.: 4231.3
LOGGED BY: MT
HOLE NO.: DH-16



ELEVATION / DEPTH	SOIL SYMBOLS, SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)	Recovery (in/in)
		CL	SANDY CLAY: Black, fine to medium, with some silt, mica, very moist.	L-1	0-2.5	15/30
				L-2	2.5-5	30/30
		CL	SILTY CLAY: Dark gray to gray, slightly sandy, roots, iron oxide staining, very moist.			
		SM		L-3	5-7.5	18/30
		CL	SILTY SAND: Gray, fine to coarse, wet.			
			SILTY CLAY: Gray, slightly silty and sandy, iron oxide staining, very moist to wet.	L-4	7.5-10	30/30
		SP	SAND: Gray, coarse, wet.	L-5	10-12.5	0/30
			...grades to fine to medium sand.	L-6	12.5-15	30/30
				L-7	15-17.5	0/30
				L-8	17.5-20	30/30
				L-9	20-22.5	0/30
			...grades to fine sand.	L-10	22.5-25	30/30
				L-11	25-27.5	0/30
				L-12	27.5-30	30/30
		CL	SILTY CLAY: Gray, with some silty sand lenses, roots, moist to very moist.	L-13	30-32.5	24/30

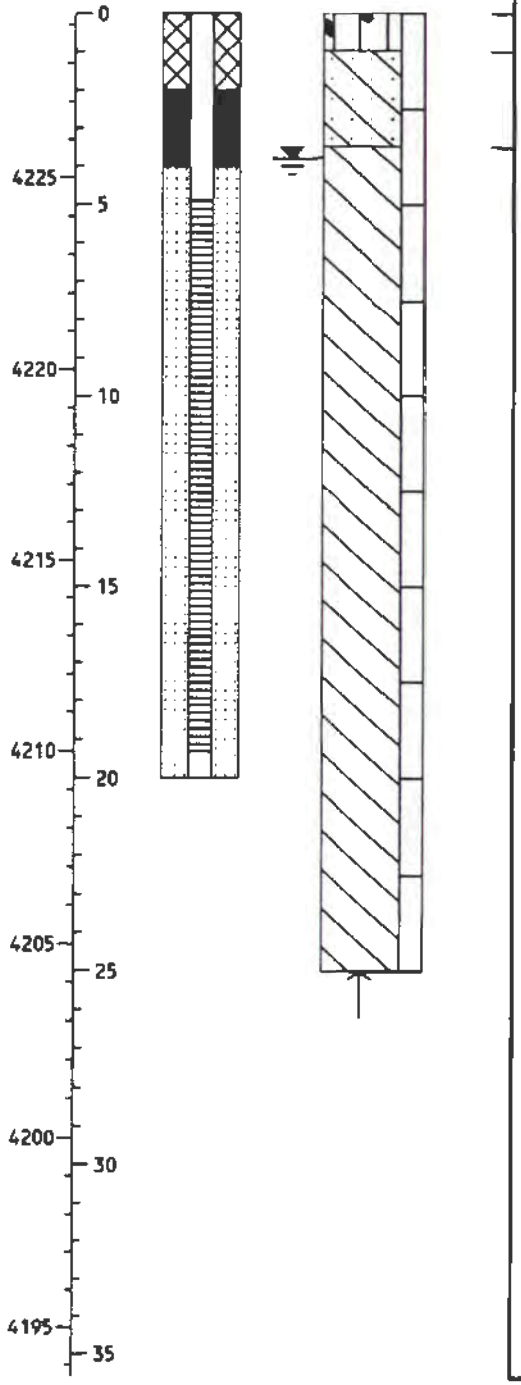
Drill hole backfilled with bentonite

DRILL HOLE LOGS
AND
PIEZOMETER COMPLETION DETAILS

DRILL HOLE LOG
DRILL HOLE NO.: DH-41

PROJECT: Syro Steel RFI
CLIENT/OWNER: Syro Steel Company
HOLE LOCATION: West of RCRA Impoundment
DRILLER: Bedke Drilling Company
DRILL RIG: Acker Soil Sentry
DEPTH TO WATER: 3.79 HOLE DIAMETER: 7.25"

PROJECT NO.: 1104-007
DATE: 6-17-91
TOC ELEV.: 4231.35
GS ELEV.: 4229.3
LOGGED BY: DCH
HOLE NO.: DH-41

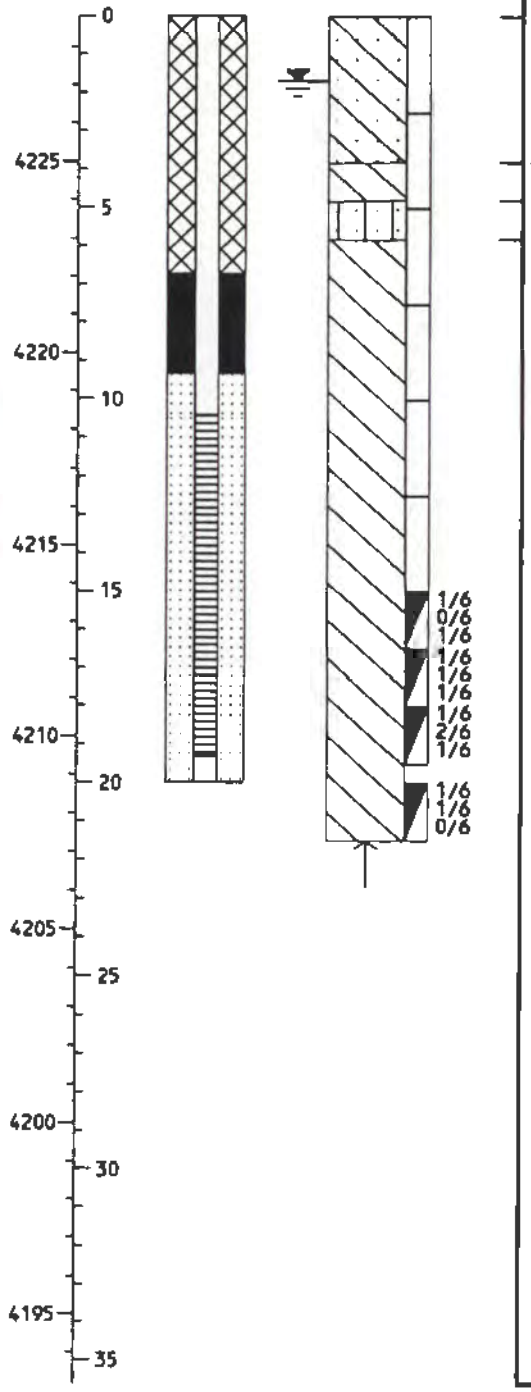


USCS	Description	Sample Number	Sample Depth (ft)	Recovery (in/in)
GM	FILL: Gray & brown, silty sandy gravel, moist.	B-1	0-2.5	12/30
CL	SANDY CLAY: Black, fine, with some silt, roots, moist.	L-1	2.5-5	30/30
CL	SILTY CLAY: Dark gray, slightly sandy, occasional iron oxide staining, moist.			
	...grades to greenish gray, @ 4.5'	L-2	5-7.5	30/30
		L-3	7.5-10	30/30
		L-4	10-12.5	30/30
	...grades to trace fine sand.			
	...grades to trace iron oxide staining.	L-5	12.5-15	30/30
	...grades to gray.			
	...occasional roots.	L-6	15-17.5	30/30
		L-7	17.5-20	30/30
		L-8	20-22.5	30/30
		L-9	22.5-25	30/30

DRILL HOLE LOG
DRILL HOLE NO.: DH-42

PROJECT: Syro Steel RFI
CLIENT/OWNER: Syro Steel Company
HOLE LOCATION: NW of SWMU #1
DRILLER: Bedke Drilling Companuy
DRILL RIG: Acker Soil Sentry
DEPTH TO WATER: 1.66 HOLE DIAMETER: 7.25"

PROJECT NO.: 1104-007
DATE: 6-19-91
TOC ELEV.: 4230.90
GS ELEV.: 4228.8
LOGGED BY: DCH
HOLE NO.: DH-42

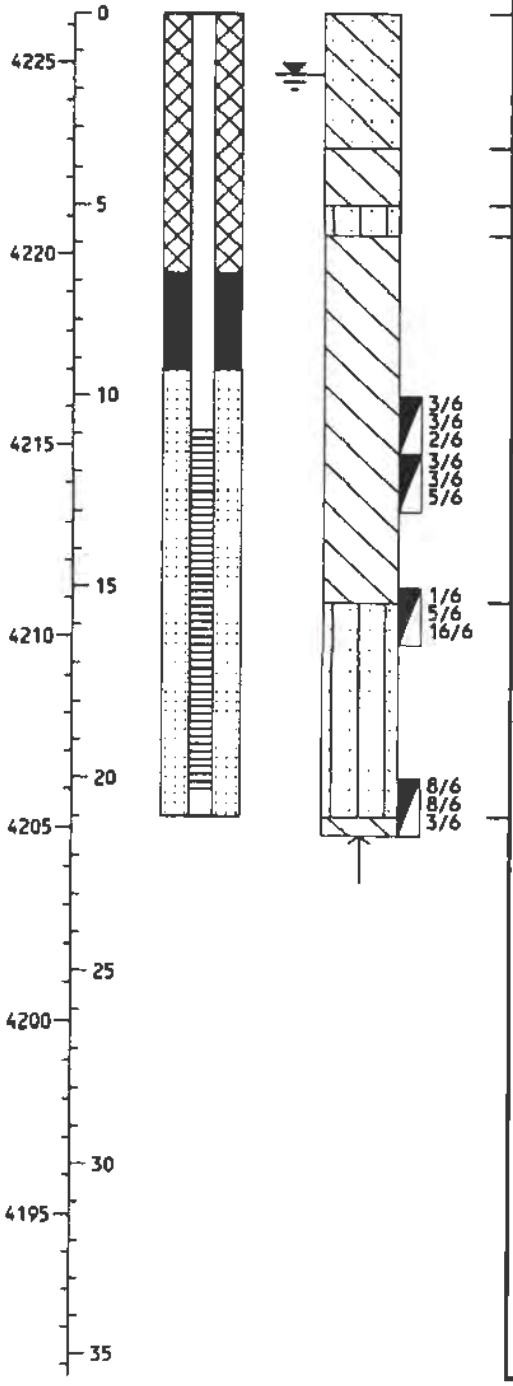


USCS	Description	Sample Number	Sample Depth (ft)	Recovery (in/in)
CL	SANDY CLAY: Black, fine, with some silt, mica, roots, moist.	L-1	0-2.5	0/30
		L-2	2.5-5	0/30
CL	SILTY CLAY: Gray, sandy, iron oxide staining, moist.			
SM	SILTY SAND: Gray, fine to medium. wet.	L-3	5-7.5	0/30
CL	SILTY CLAY: Gray, sandy, fine to medium, moist.	L-4	7.5-10	20/30
	...Grades to trace fine sand.	L-5	10-12.5	0/30
		L-6	12.5-15	0/30
	...grades to dark gray.	B-1	15-16.5	18/18
		B-2	16.5-18	18/18
		B-3	18-19.5	18/18
		B-4	20-21.5	18/18

DRILL HOLE LOG
DRILL HOLE NO.: DH-43

PROJECT: Syro Steel RFI
CLIENT/OWNER: Syro Steel Company
HOLE LOCATION: NW of RCRA Impoundment
DRILLER: Bedke Drilling Company
DRILL RIG: Acker Soil Centry
DEPTH TO WATER: 1.6 HOLE DIAMETER: 7.25"

PROJECT NO.: 1104-007
DATE: 6-20-91
TOC ELEV.: 4228.15
GS ELEV.: 4226.3
LOGGED BY: DCH
HOLE NO.: DH-43



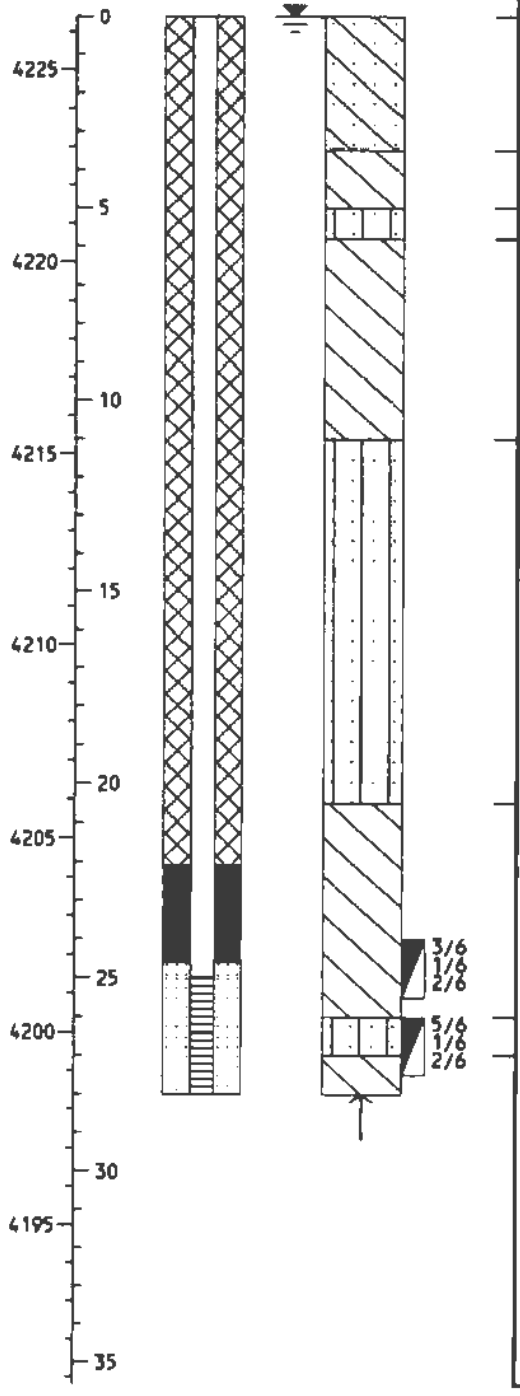
ELEVATION / DEPTH	USCS	Description	Sample Number	Sample Depth (ft)	Recovery (in/in)
	CL	SANDY CLAY: Black, fine, with some silt, roots, mica, moist.			
	CL	SILTY CLAY: Gray, slightly sandy, fine, iron oxide staining, very moist.			
	SM	SILTY SAND: Gray, fine to medium, wet.			
	CL	SILTY CLAY: Gray, slighty sandy, fine, iron oxide staining, very moist.			
		...grades to greenish gray, wet.	B-1	10-11.5	18/18
			B-2	11.5-13	18/18
		...grades very silty.			
	SM	SILTY SAND: Gray, fine to medium, wet.	B-3	15-16.5	18/18
			B-4	20-21.5	18/18
	CL	CLAY: Gray, sandy, very moist.			

The drill hole log description from 0 to 10 feet was taken from DH-4, 5 feet to the north.

DRILL HOLE LOG
DRILL HOLE NO.: DH-44

PROJECT: Syro Steel RFI
CLIENT/OWNER: Syro Steel Company
HOLE LOCATION: NW of RCRA Impoundment.
DRILLER: Bedke Drilling Company
DRILL RIG: Acker Soil Sentry
DEPTH TO WATER: 0 * HOLE DIAMETER: 7.25"

PROJECT NO.: 1104-007
DATE: 6-21-91
TOC ELEV.: 4228.07
GS ELEV.: 4226.4
LOGGED BY: DCH
HOLE NO.: DH-44



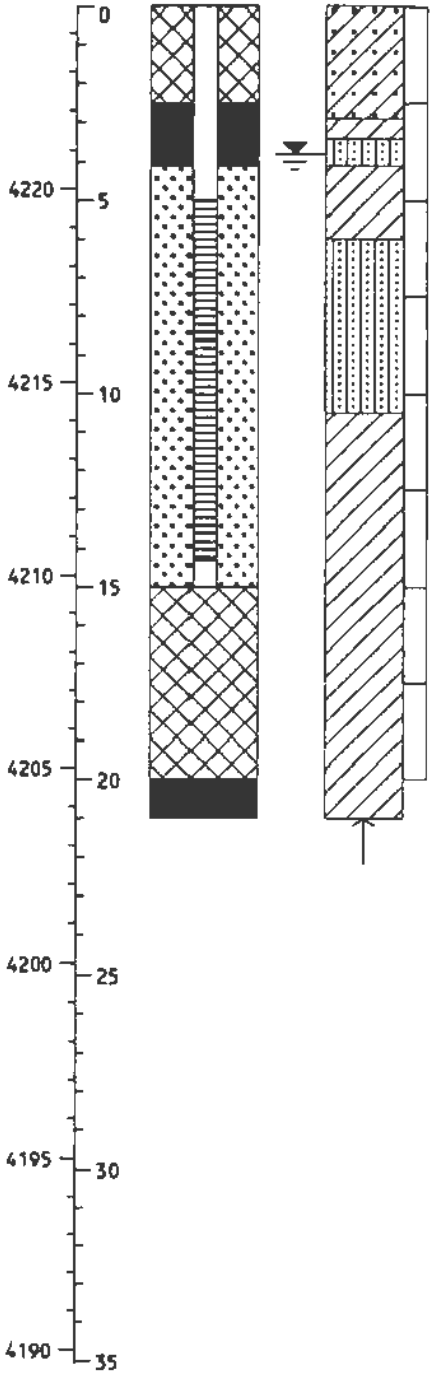
ELEVATION / DEPTH	WELL DETAILS	SOIL SYMBOLS, SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)	Recovery (in/in)
			CL	SANDY CLAY: Black, fine, with some silt, roots, mica.			
			CL	SILTY CLAY: Gray, slightly sandy, fine, iron oxide staining, moist.			
			SM	SILTY SAND: Gray, fine to medium, wet.			
			CL	SILTY CLAY: Gray, slightly sandy, fine, iron oxide staining, wet.			
			SM	SILTY SAND: Dark gray, fine to medium, wet. ...grades very silty and sandy.			
			CL	CLAY: Dark gray, slightly sandy, moist.			
		3/6 1/6 2/6			B-1	24-26.5	18/18
		5/6 1/6 2/6	SM	SILTY SAND: Greenish gray, fine to medium, wet.	B-2	26-27.5	18/18
			CL	CLAY: Gray, sandy, very moist.			

Drill hole description 0-24 ft. taken from DH-4, 10 ft. to the north.
* Flowing.

DRILL HOLE LOG
DRILL HOLE NO.: DH-45

PROJECT: Syro RFI
CLIENT/OWNER: Syro, Inc.
HOLE LOCATION: West of Ricks Ditch.
DRILLER: Bedke Drilling
DRILL RIG: Acker Soil Sentry
DEPTH TO WATER: 3.79 HOLE DIAMETER: 7.25"

PROJECT NO.: 1104-007
DATE: 6-26-91
TOC ELEV.: 4226.30
GS ELEV.: 4224.7
LOGGED BY: DCH
HOLE NO.: DH-45



ELEVATION / DEPTH	WELL DETAILS	SOIL SYMBOLS, SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)	Recovery (in/in)
			CL	SANDY CLAY: Black, fine, with some silt, mica, roots, moist.	L-1	0-2.5	0/30
			CL	SILTY CLAY: Gray, sandy, fine, iron oxide staining, roots, moist.	L-2	2.5-5	27/30
			SM				
			CL	SILTY SAND: Greenish gray, fine to medium, very moist.	L-3	5-7.5	0/30
			SM	SILTY CLAY: Gray, sandy, fine, iron oxide staining, roots, moist.	L-4	7.5-10	30/30
				SILTY SAND: Greenish gray, fine to medium, roots, occasional clay lenses, wet.	L-5	10-12.5	30/30
			CL	SILTY CLAY: Gray, slightly sandy, iron oxide staining, roots, very moist.	L-6	12.5-15	30/30
					L-7	15-17.5	30/30
					L-8	17.5-20	30/30

DRILL HOLE LOGS

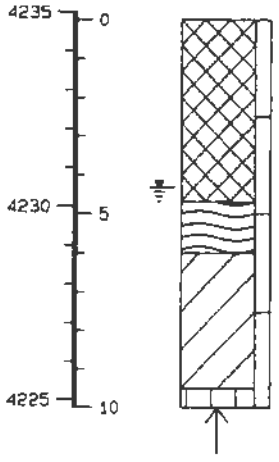
SOLID WASTE MANAGEMENT UNIT #1

DRILL HOLE LOG

DRILL HOLE NO.: DH-SM1-1

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO Steel Company
HOLE LOCATION: SWMU 1
DRILLER: Bedke Drilling Company
DRILL RIG: Acker Soil Sentry
DEPTH TO WATER: 4.3' HOLE DIAMETER: 7.25"

PROJECT NO.: 1104-007
DATE: 6-3-91
TOC ELEV.: NA
GS ELEV.: 4234.8
LOGGED BY: DCH
HOLE NO.: DH-SM1-1



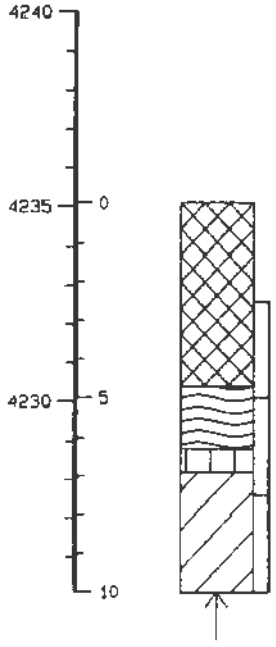
ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth	Recovery ft/ft
			FILL: Brown & gray, silty sandy gravel, slag, moist, (0'-2'). Tan to gray clay, sandy, moist, (2'-4.7').	L-1	0-2.5	6/30
				L-2	2.5-5	30/30
			SLUDGE: Dark gray to black, clayey sand, wet Thin layer of lime above sludge.	L-3	5-7.5	30/30
		CL	SILTY CLAY: Greenish gray, sandy, fine to medium, very moist.	L-4	7.5-10	30/30
		SM	SILTY SAND: Greenish gray, fine to medium, slightly clayey, wet.			

DRILL HOLE LOG

DRILL HOLE NO.: DH-SM1-2

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO Steel Company
HOLE LOCATION: SWMU 1
DRILLER: Bedke Drilling Company
DRILL RIG: Acker Soil Sentry
DEPTH TO WATER: *

PROJECT NO.: 1104-007
DATE: 6-3-91
TOC ELEV.: NA
GS ELEV.: 4235.1
LOGGED BY: DCH
HOLE DIAMETER: 7.25"
HOLE NO.: DH-SM1-2



ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth	Recovery ft/ft
			FILL: Brown & gray, silty sandy gravel, slag, moist, (0'-2') Tan to gray clay, sandy, moist, (2'-4 7').	B-1	2.5-5	30/30
			SLUDGE: Dark gray to black, clayey sand, lime, wet. Thin layer of lime above sludge.	L-2	5-7 5	30/30
		SM	SILTY SAND: Dark brown, clayey, fine to medium, very moist.	L-3	7 5-10	30/30
		CL	SILTY CLAY: Greenish gray, sandy, fine to medium, moist			

* Not measured.

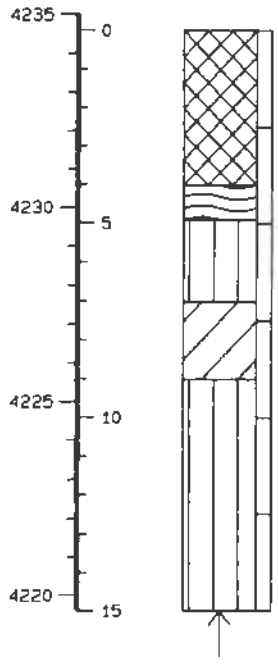
DRILL HOLE LOG

DRILL HOLE NO.: DH-SM1-3

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO Steel Company
HOLE LOCATION: SWMU 1
DRILLER: Bedke Drilling Company
DRILL RIG: Acker Soil Sentry
DEPTH TO WATER: *

HOLE DIAMETER: 7.25"

PROJECT NO.: 1104-007
DATE: 6-3-91
TOC ELEV.: NA
GS ELEV.: 4234.6
LOGGED BY: DCH
HOLE NO.: DH-SM1-3



ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth	Recovery ft/ft
			FILL: Gray & brown, silty sandy gravel, slag, moist (0'-2'). Gray to brown clay, sandy, moist, (2'-4')	L-1	0-2.5	10/30
				L-2	2 5	30/30
			SLUDGE: Dark gray, clayey sand, very moist Thin layer of lime above sludge.	L-3	5-7 5	20/30
		SM	SILTY SAND: Black, fine to coarse, gravely & clayey, wet			
		CL	SILTY CLAY: Tan, sandy, fine to medium, iron oxide staining, wet	L-4	7.5-10	30/30
		SM	SILTY SAND: Greenish gray, fine to medium, iron oxide staining, wet	L-5	10-12 5	30/30
				L-6	12 5-15	30/30

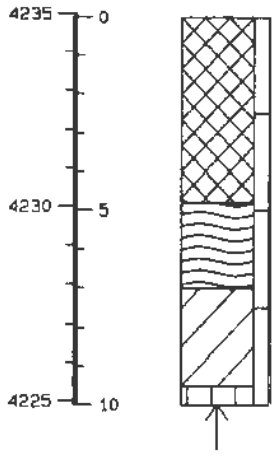
* Not measured.

DRILL HOLE LOG

DRILL HOLE NO.: DH-SM1-4

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO Steel Company
HOLE LOCATION: SWMU 1
DRILLER: Bedke Drilling Company
DRILL RIG: Acker Soil Sentry
DEPTH TO WATER: *
HOLE DIAMETER: 7.25"

PROJECT NO.: 1104-007
DATE: 6-3-91
TOC ELEV.: NA
GS ELEV.: 4234.9
LOGGED BY: PC
HOLE NO.: DH-SM1-4



ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth	Recovery ft/ft
			FILL: Brown & gray, silty sandy gravel, slag, moist (0'-2'). Tan to gray clay, sandy, moist, (2'-4.8').	B-1	0-2.5	14/30
				L-2	2.5-5	30/30
			SLUDGE: Dark gray, clayey sand, wet Thin layer of lime above sludge	L-3	5-7.5	20/30
		CL	SILTY CLAY: Greenish gray, sandy, fine to medium, very moist.	L-4	7.5-10	30/30
		SM	SILTY SAND: Greenish gray, fine to medium, wet.			

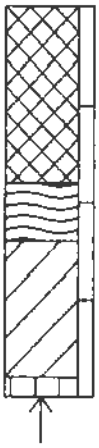
* Not measured.

DRILL HOLE LOG

DRILL HOLE NO.: DH-SM1-5

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO Steel Company
HOLE LOCATION: SWMU 1
DRILLER: Bedke Drilling Company
DRILL RIG: Acker Soil Sentry
DEPTH TO WATER: *
HOLE DIAMETER: 7.25"

PROJECT NO.: 1104-007
DATE: 6-3-91
TOC ELEV.: NA
GS ELEV.: 4234.9
LOGGED BY: DCH
HOLE NO.: DH-SM1-5

ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth	Recovery ft/ft
4235 — 0			FILL: Reddish brown, silty sandy gravel, moist, (0'-1'). Brown to tan sandy clay, moist, (1'-4.5').	L-1	0-2.5	6/30
				L-2	2.5-5	30/30
4230 — 5			SLUDGE: Black, gray & brown, clayey sand, very moist.	L-3	5-7.5	30/30
		CL	SILTY CLAY: Greenish gray, sandy, fine to medium, iron oxide staining, moist.	L-4	7.5-10	30/30
4225 — 10		SM	SILTY SAND: Greenish gray, fine to medium, clayey, wet.			

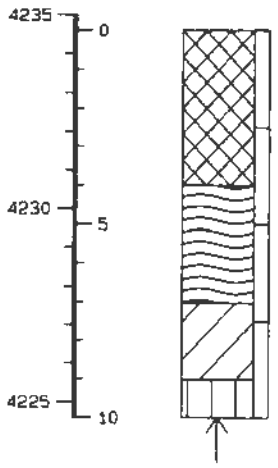
* Not measured.

DRILL HOLE LOG

DRILL HOLE NO.: DH-SM1-6

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO Steel Company
HOLE LOCATION: SWMU 1
DRILLER: Bedke Drilling Company
DRILL RIG: Acker Soil Sentry
DEPTH TO WATER: *
HOLE DIAMETER: 7.25"

PROJECT NO.: 1104-007
DATE: 6-3-91
TOC ELEV.: NA
GS ELEV.: 4234.6
LOGGED BY: DCH
HOLE NO.: DH-SM1-6



ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth	Recovery ft/ft
			FILL: Brown & gray, silty sandy gravel, moist, (0'-1'). Brown to tan clay, moist, (1'-4').	L-1	0-2.5	0/30
				L-2	2.5-5	30/30
			SLUDGE: Black to dark brown, sand, fine to coarse, clayey, wet.	L-3	5-7.5	30/30
		CL	SILTY CLAY: Greenish gray, sandy, fine to medium, iron oxide staining, very moist.	L-4	7.5-10	30/30
		SM	SILTY SAND: Greenish gray, fine to medium, iron oxide staining, wet			

* Not measured.

DRILL HOLE LOGS

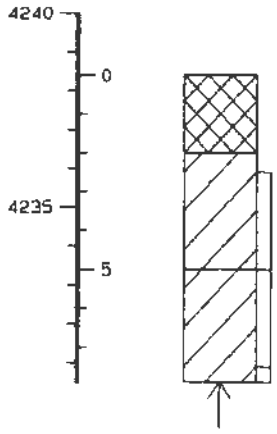
SOLID WASTE MANAGEMENT UNIT #2

DRILL HOLE LOG

DRILL HOLE NO.: DH-SM2-1

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO Steel Company
HOLE LOCATION: SWMU 2
DRILLER: Bedke Drilling Company
DRILL RIG: Acker Soil Sentry
DEPTH TO WATER: * HOLE DIAMETER: 7.25"

PROJECT NO.: 1104-007
DATE: 6-4-91
TOC ELEV.: NA
GS ELEV.: 4238.4
LOGGED BY: PC
HOLE NO.: DH-SM2-1



ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth	Recovery ft/ft
			FILL Reddish brown, silty sandy gravel, moist.			
		CL	SANDY CLAY: Dark gray to black, moist.	L-1	2.5-5	27/30
		CL	SILTY CLAY: Dark brown, sandy, fine to coarse, wet.	B-2	5-7.5	7/30
				B-3	7.5-7.9	4/4

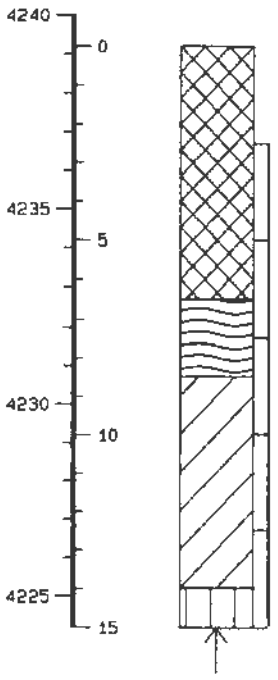
* Not measured

DRILL HOLE LOG

DRILL HOLE NO.: DH-SM2-2

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO Steel Company
HOLE LOCATION: SWMU 2
DRILLER: Bedke Drilling Company
DRILL RIG: Acker Soil Sentry
DEPTH TO WATER: *

PROJECT NO.: 1104-007
DATE: 6-3-91
TOC ELEV.: NA
GS ELEV.: 4239.2
LOGGED BY: PC
HOLE DIAMETER: 7.25"
HOLE NO.: DH-SM2-2



ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth	Recovery ft/ft
			FILL: Reddish brown, silty sandy gravel, moist.	B-1	2.5	20/30
				L-1	5-7.5	20/30
			SLUDGE: Dark gray to black, clayey sand, trace lime, wet.	L-2	7.5-10	30/30
		CL	SILTY CLAY: Greenish gray, sandy, fine to medium, iron oxide staining, moist.	L-3	10-12.5	17/30
				L-4	12.5-15	30/30
		SM	SILTY SAND: Greenish gray, clayey, fine, wet.			

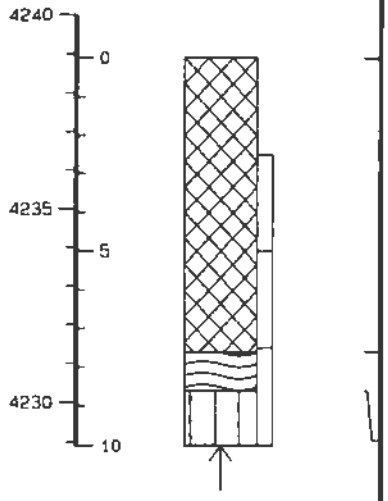
* Not measured.

DRILL HOLE LOG

DRILL HOLE NO.: DH-SM2-3

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO Steel Company
HOLE LOCATION: SWMU 2
DRILLER: Bedke Drilling Company
DRILL RIG: Acker Soil Sentry
DEPTH TO WATER: *
HOLE DIAMETER: 7.25"

PROJECT NO.: 1104-007
DATE: 6-4-91
TOC ELEV.: NA
GS ELEV.: 4238.9
LOGGED BY: PC
HOLE NO.: DH-SM2-3



ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth	Recovery ft/ft
			FILL: Reddish brown, silty sandy gravel, moist, (0'-2.5'). Dark brown sandy clay, construction debris (wood, concrete, bricks, etc.) moist.	B-1	2.5-5	7/30
				B-2	5-7.5	7/30
			SLUDGE: Dark brown, clayey sand, iron oxide staining, moist. Thin layers of lime above sludge.	L-3	7.5-10	30/30
		SM	SILTY SAND: Greenish gray, fine to medium wet.			

* Not measured.

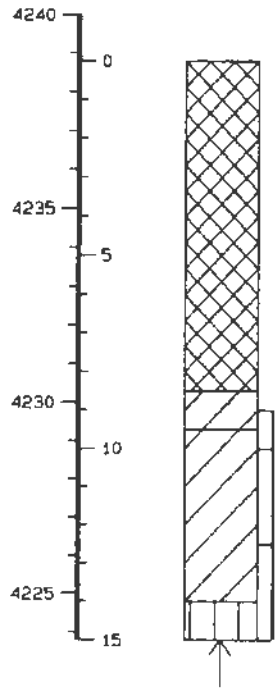
DRILL HOLE LOG

DRILL HOLE NO.: DH-SM2-4

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO Steel Company
HOLE LOCATION: SWMU 2
DRILLER: Bedke Drilling Company
DRILL RIG: Acker Soil Sentry
DEPTH TO WATER: *

HOLE DIAMETER: 7.25"

PROJECT NO.: 1104-007
DATE: 6-4-91
TOC ELEV.: NA
GS ELEV.: 4238.8
LOGGED BY: PC
HOLE NO.: DH-SM2-4



ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth	Recovery ft/ft
			FILL Reddish brown, silty sandy gravel, moist, (0'-2.5') Brown sandy clay, concrete, moist, (2.5'-7.6').			
		CL	SANDY CLAY: Dark brown to black, fine to medium, wet.	B-1	9-10	6/12
		CL	SILTY CLAY: Greenish gray, iron oxide staining, wet.	L-1	10-12.5	30/30
				L-2	12.5-15	30/30
		SM	SILTY SAND: Greenish gray, fine to medium, wet.			

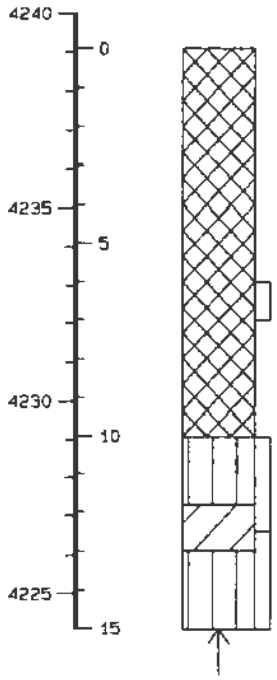
* Not measured.

DRILL HOLE LOG

DRILL HOLE NO.: DH-SM2-5

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO Steel Company
HOLE LOCATION: SWMU 2
DRILLER: Bedke Drilling Company
DRILL RIG: Acker Soil Sentry
DEPTH TO WATER: *
HOLE DIAMETER: 7.25"

PROJECT NO.: 1104-007
DATE: 6-4-91
TOC ELEV.: NA
GS ELEV.: 4239.1
LOGGED BY: PC
HOLE NO.: DH-SM2-5



ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth	Recovery ft/ft
			FILL: Reddish brown, silty sandy gravel, moist, (0'-2'). Dark brown brown to black clayey sandy gravel, and construction debris (wood, concrete, bricks, etc.), moist, (2'-10').	B-1	6-7	8/12
		SM	SILTY SAND: Dark brown, fine to medium, wet	L-2	10-12.5	15/30
		CL	SILTY CLAY: Gray, iron oxide staining, moist.	L-3	12.5-15	30/30
		SM	SILTY SAND: Greenish gray, fine to medium, wet.			

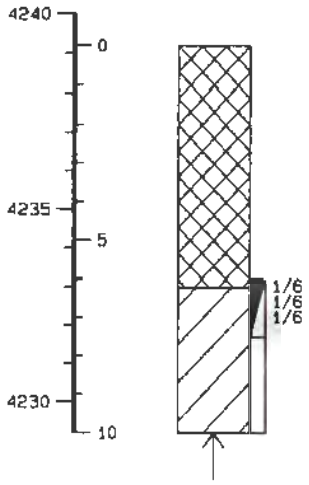
* Not measured.

DRILL HOLE LOG

DRILL HOLE NO.: DH-SM2-6

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO Steel Company
HOLE LOCATION: SWMU 2
DRILLER: Bedke Drilling Company
DRILL RIG: Acker Soil Sentry
DEPTH TO WATER: *
HOLE DIAMETER: 7.25"

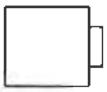
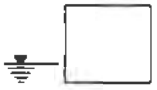
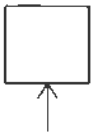
PROJECT NO.: 1104-007
DATE: 6-5-91
TOC ELEV.: NA
GS ELEV.: 4239.2
LOGGED BY: PC
HOLE NO.: DH-SM2-6



ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth	Recovery ft/ft
			FILL Reddish brown, silty sandy gravel, moist, (0'-1'). Brown, silty sandy gravel and construction debris (wood, concrete, bricks, etc.) moist, (1'-6.2').			
		CL	SILTY CLAY: Greenish gray, sandy, fine to medium, wet. Thin layer of lime.	B-1	6-7.5	18/18
			..grades to greenish gray, iron oxide staining, moist.	B-2	7.5-10	30/30

* Not measured.

Legend:

Symbol:	Description:	Symbol:	Description:
	FILL: Brown & gray, silty sandy gravel, slag, moist, (0'-2'). Tan to gray clay, sandy, moist, (2'-4.7').		
	SLUDGE: Dark gray to black, clayey sand, wet. Thin layer of lime above sludge.		
	SILTY CLAY: Greenish gray, sandy, fine to medium, wet. Thin layer of lime.		
	SILTY SAND: Greenish gray, fine to medium, slightly clayey, wet.		
	SANDY CLAY: Dark gray to black, moist.		
	SPT1 2" O.D. sampler, 140 lb. hammer, 30" drop		SPT3 3" O.D. sampler, 140 lb. hammer, 30" drop
	Groundwater Level		Hole Completion Depth

Notes:

1. Drill holes were drilled between June 18 and 24, 1991 using an Acker Sentry drill rig with 7 1/4" hollow stem auger.
2. Continuous soil samples were obtained using a CME continuous and split spoon sampler Sample recovery is inches or recovery per inches drilled.
3. Drill hole locations were measured from existing features.
4. These logs are subject to the limitations, conclusions, and recommendations in this report.

TEST PIT LOGS

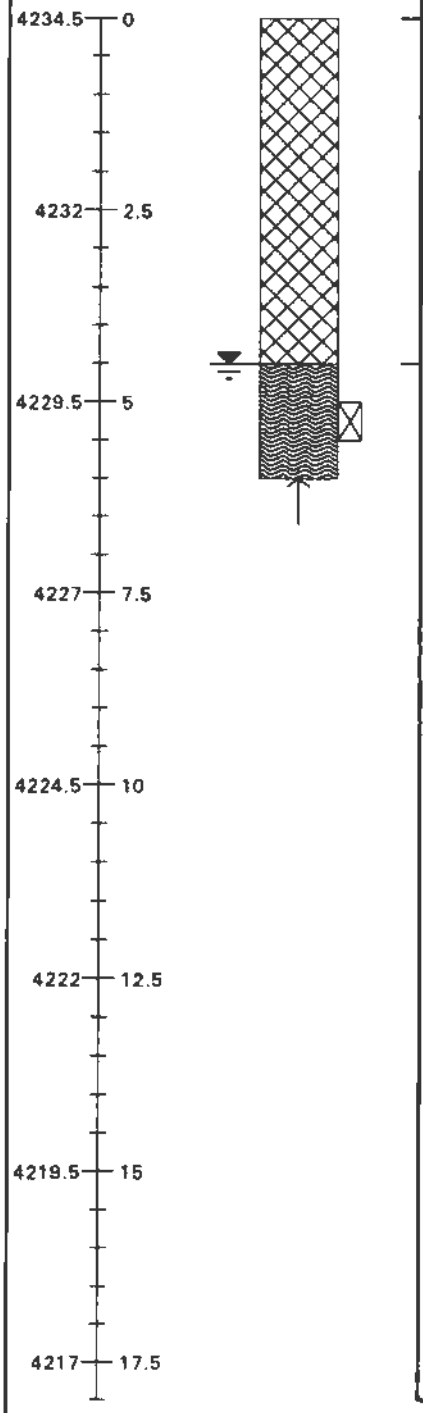
SOLID WASTE MANAGEMENT UNIT #1

TEST PIT LOG

TEST PIT NO.: TP-SM1-1S

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO STEEL COMPANY
LOCATION: SWMU 1, North Boundary
EQUIPMENT: Backhoe (Track Mount)
GS ELEV.: 4234.5
DEPTH TO WATER: 4.5'

PROJECT NO.: 1104
DATE: 6-3-91
LOGGED BY: DCH
PIT WIDTH: 3.5'
PIT LENGTH: 33'
TEST PIT NO.: TP-SM1-1S



ELEVATION / DEPTH	SOIL SYMBOLS, SAMPLER SYMBOLS, AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)
			FILL: Gray to brown, slag, sandy gravel, gravel, moist, (0'-2'). Gray & brown, clay sandy, wet, (2'-4.5'). Thin layer of lime above sludge.		
			...grades to wet.		
			SLUDGE: Dark gray to black, sandy clay, wet. Thin layer of lime above sluge.	B-1	5

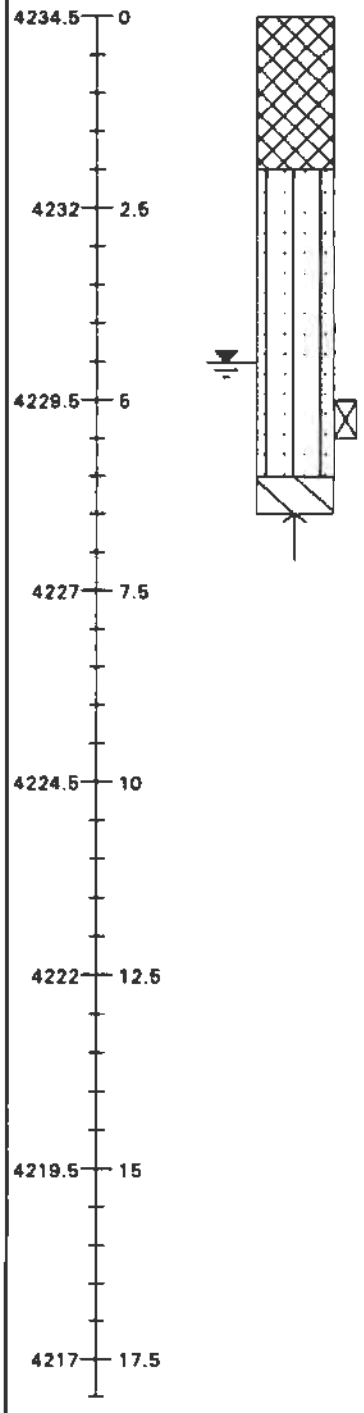
South end of TP-SM1-1

TEST PIT LOG

TEST PIT NO.: TP-SM1-1N

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO STEEL COMPANY
LOCATION: SWMU 1, North Boundary
EQUIPMENT: Backhoe (Track Mount)
GS ELEV.: 4234.5
DEPTH TO WATER: 4.5'

PROJECT NO.: 1104
DATE: 6-3-91
LOGGED BY: DCH
PIT WIDTH: 3.5'
PIT LENGTH: 33'
TEST PIT NO.: TP-SM1-1N



ELEVATION / DEPTH	SOIL SYMBOLS, SAMPLER SYMBOLS, AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)
			FILL: Gray & brown, slag, silty sandy gravel, moist.		
		SM	SILTY SAND: Dark gray to gray, fine to medium, moist.		
			...iron oxide staining, 2" layer.		
			...grades to wet.		
				B-1	5
		CL	SILTY CLAY: Tan, sandy, fine to medium, very moist.		

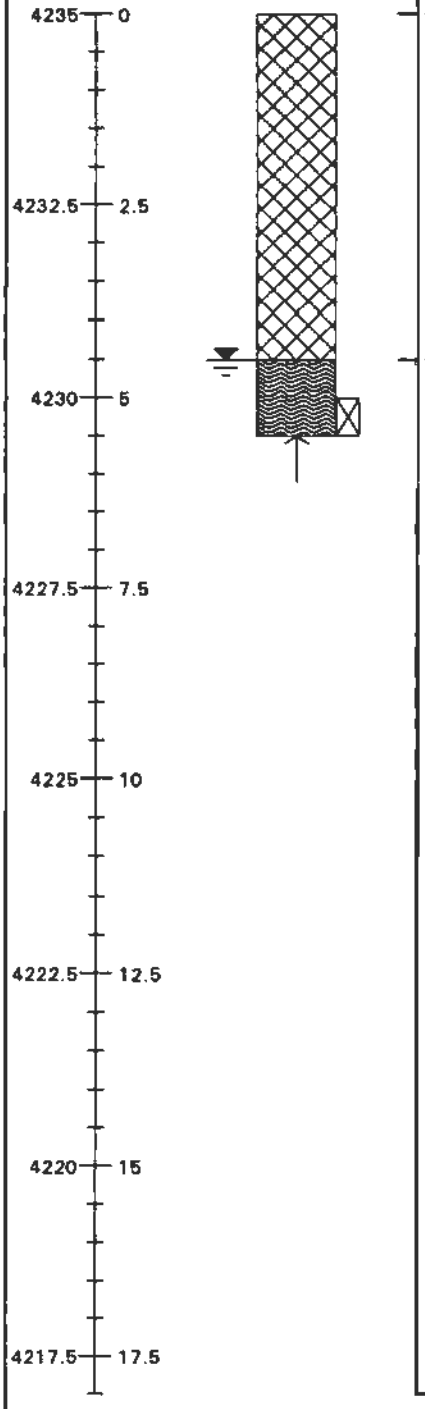
North end of TP-SM1-1

TEST PIT LOG

TEST PIT NO.: TP-SM1-2W

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO STEEL COMPANY
LOCATION: SWMU 1, East Boundary
EQUIPMENT: Backhoe (Track Mount)
GS ELEV.: 4235.0
DEPTH TO WATER: 4.5'

PROJECT NO.: 1104
DATE: 6-4-91
LOGGED BY: DCH
PIT WIDTH: 3.5'
PIT LENGTH: 16'
TEST PIT NO.: TP-SM1-2W



ELEVATION / DEPTH	SOIL SYMBOLS, SAMPLER SYMBOLS, AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)
			FILL: Gray & brown, slag, sandy gravel, moist, (0'-1'). Dark gray, silty sand with construction debris (bricks, wood, moist, (1'-4.5').		
			SLUDGE: Dark gray to black clayey sand, wet.	B-1	5

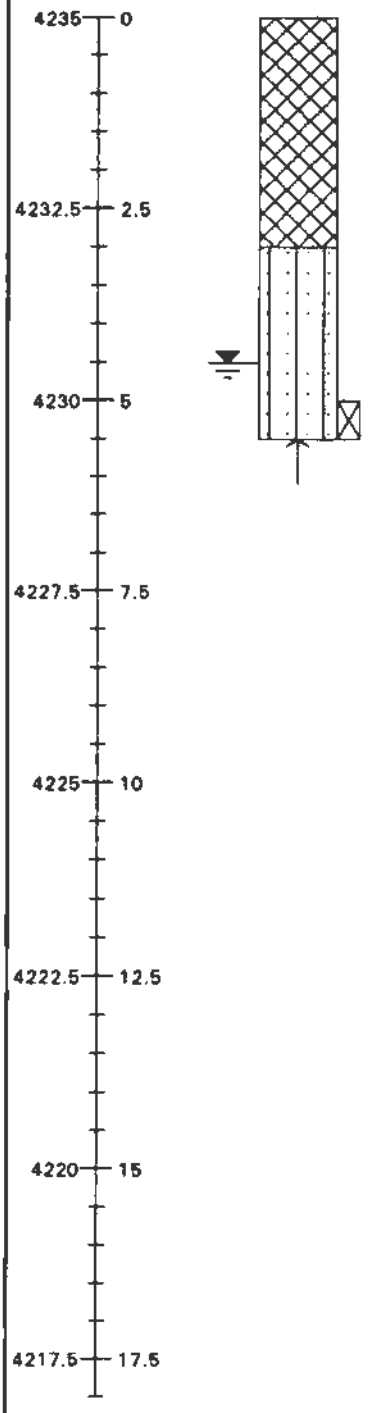
West end of TP-SM1-2

TEST PIT LOG

TEST PIT NO.: TP-SM1-2E

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO STEEL COMPANY
LOCATION: SWMU 1, East Boundary
EQUIPMENT: Backhoe (Track Mount)
GS ELEV.: 4235.0
DEPTH TO WATER: 4.5'

PROJECT NO.: 1104
DATE: 6-4-91
LOGGED BY: DCH
PIT WIDTH: 3.5'
PIT LENGTH: 16'
TEST PIT NO.: TP-SM1-2E



ELEVATION / DEPTH	SOIL SYMBOLS, SAMPLER SYMBOLS, AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)
			FILL: Gray & brown, slag, silty sandy gravel, moist, (0'-2'). Gray clayey sand, moist, (2'-3').		
		SM	SILTY SAND: Dark gray to gray, fine to medium, clayey, moist.		
			...grades to wet.	B-1	5

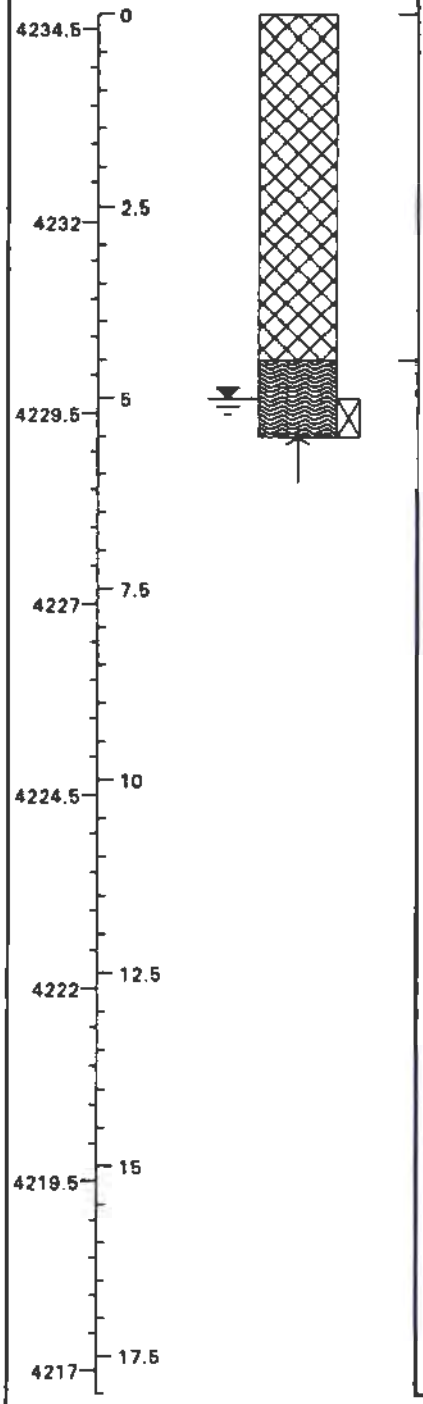
East end of TP-SM1-2

TEST PIT LOG

TEST PIT NO.: TP-SM1-3N

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO STEEL COMPANY
LOCATION: SWMU 1, South Boundary
EQUIPMENT: Backhoe (Track Mount)
GS ELEV.: 4234.7
DEPTH TO WATER: 5'

PROJECT NO.: 1104
DATE: 6-4-91
LOGGED BY: DCH
PIT WIDTH: 3.5'
PIT LENGTH: 14'
TEST PIT NO.: TP-SM1-3N



ELEVATION / DEPTH	SOIL SYMBOLS, SAMPLER SYMBOLS, AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)
			FILL: Brown & gray, slug, silty sandy gravel, moist, (0'-1'). Gray & brown, sandy clay, with construction debris (bricks, wood), moist, (1'-4.5'). 1'-4.5'.		
			SLUDGE: Dark gray to black, clayey sand, trace green crystals, very moist. ...grades to wet at 5'.	B-1	5

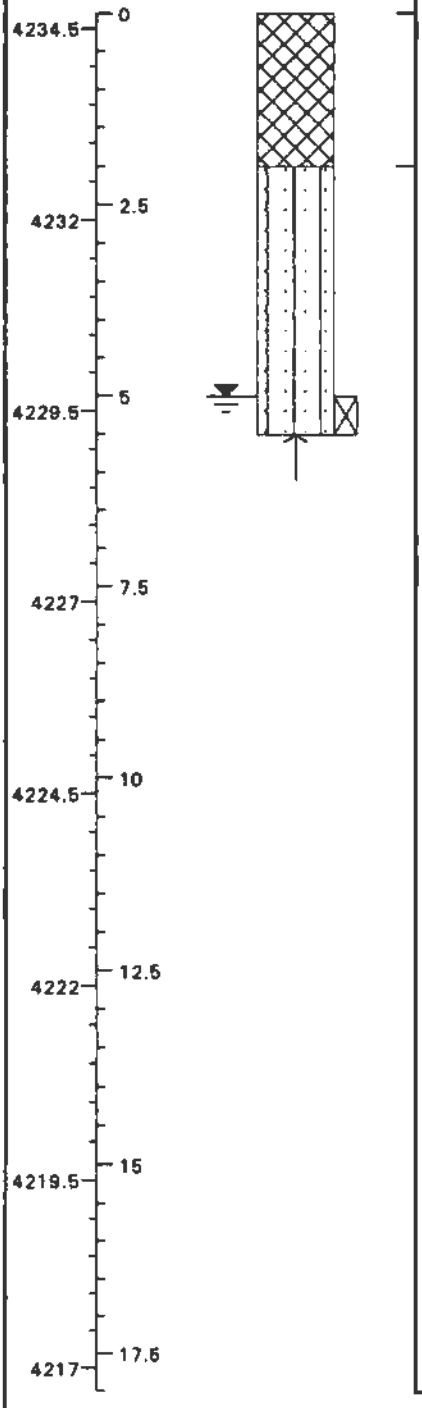
North end of TP-SM1-3

TEST PIT LOG

TEST PIT NO.: TP-SM1-3S

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO STEEL COMPANY
LOCATION: SWMU 1, South Boundary
EQUIPMENT: Backhoe (Track Mount)
GS ELEV.: 4234.7
DEPTH TO WATER: 5'

PROJECT NO.: 1104
DATE: 6-4-91
LOGGED BY: DCH
PIT WIDTH: 3.5'
PIT LENGTH: 14'
TEST PIT NO.: TP-SM1-3S



ELEVATION / DEPTH	SOIL SYMBOLS, SAMPLER SYMBOLS, AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)
			FILL: Dark gray to black, sandy clay, moist.		
		SM	SILTY SAND: Dark gray to gray, medium to coarse, clayey, moist.		
			...grades to wet.	B-1	5

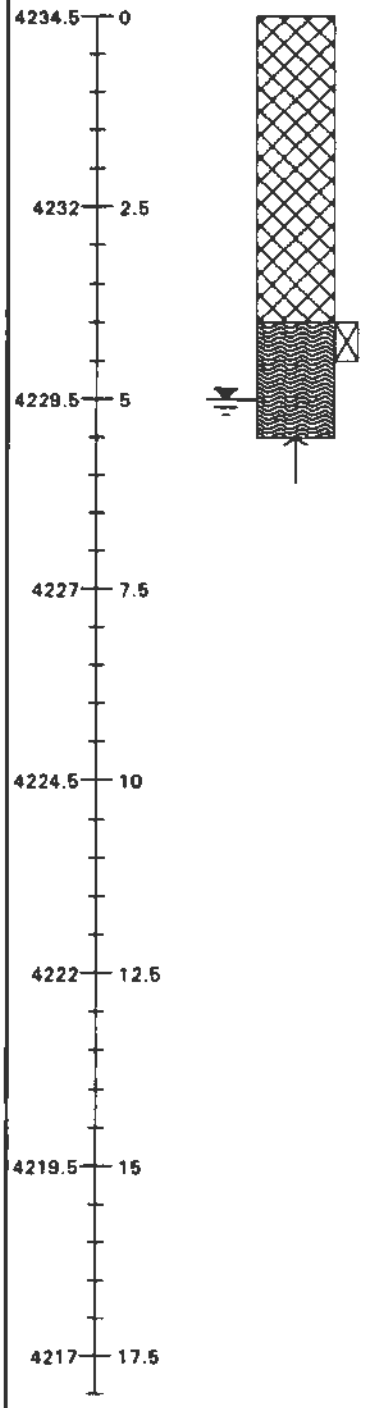
South end of TP-SM1-3

TEST PIT LOG

TEST PIT NO.: TP-SM1-4E

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO STEEL COMPANY
LOCATION: SWMU 1, West Boundary
EQUIPMENT: Backhoe (Track Mount)
GS ELEV.: 4234.5
DEPTH TO WATER: 5'

PROJECT NO.: 1104
DATE: 6-4-91
LOGGED BY: DCH
PIT WIDTH: 3.5'
PIT LENGTH: 20'
TEST PIT NO.: TP-SM1-4E



ELEVATION / DEPTH	SOIL SYMBOLS, SAMPLER SYMBOLS, AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)
			FILL: Gray & brown, silty sandy gravel, moist, from 0'-1'. Gray & brown, clay, trace sand, moist.		
			SLUDGE: Dark gray to black, clayey sand, trace green crystals, wet. Thin layer of lime above sludge.	B-1	5

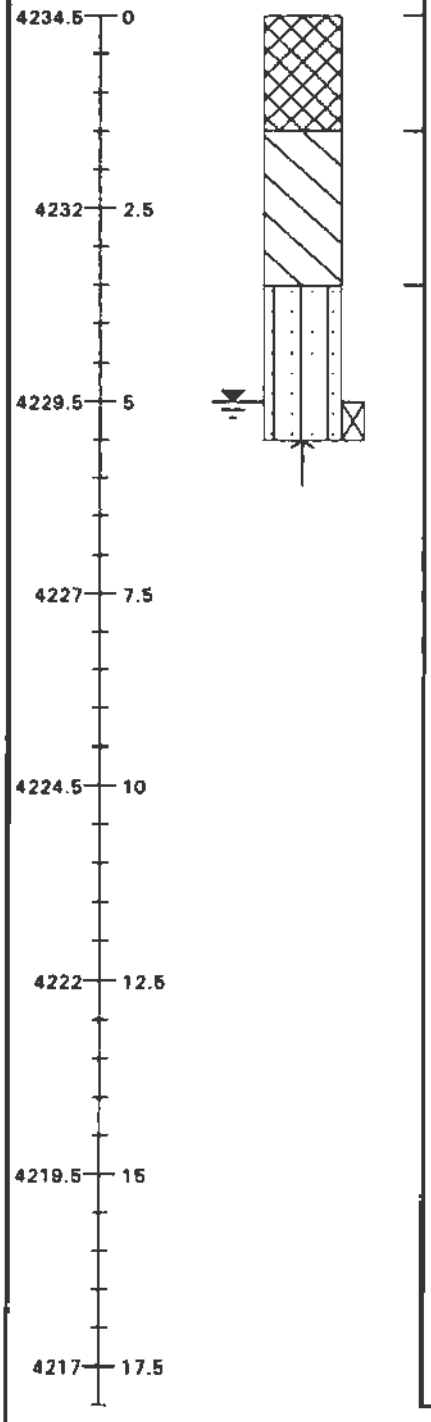
East end of TP-SM1-4

TEST PIT LOG

TEST PIT NO.: TP-SM1-4W

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO STEEL COMPANY
LOCATION: Backhoe (Track Mount)
EQUIPMENT: Backhoe (track mount)
GS ELEV.: 4234.5
DEPTH TO WATER: 5'

PROJECT NO.: 1104
DATE: 6-4-91
LOGGED BY: DCH
PIT WIDTH: 3.5'
PIT LENGTH: 20'
TEST PIT NO.: TP-SM1-4W



ELEVATION / DEPTH	SOIL SYMBOLS, SAMPLER SYMBOLS, AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)
			FILL: Dark gray, sandy clay, moist.		
		CL	SILTY CLAY: Greenish gray, sandy, fine to medium, moist.		
		SM	SILTY SAND: Dark gray to gray, fine to medium, moist. ...iron oxide staining. 1"-3" thick.		
			...grades to wet at 5'	B-1	5

West end of TP-SM1-4

TEST PIT LOGS

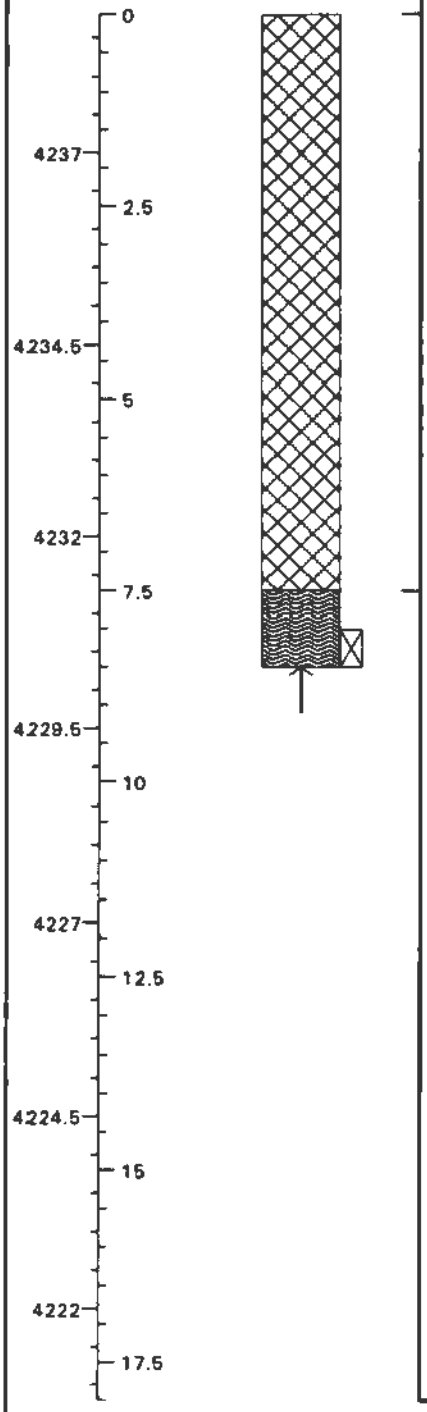
SOLID WASTE MANAGEMENT UNIT #2

TEST PIT LOG

TEST PIT NO.: TP-SM2-1S

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO STEEL COMPANY
LOCATION: SWMU 2, South Boundary
EQUIPMENT: Backhoe (Track Mount)
GS ELEV.: 4238.8
DEPTH TO WATER: Not encountered

PROJECT NO.: 1104
DATE: 6-10-91
LOGGED BY: DCH
PIT WIDTH: 3.5'
PIT LENGTH: 18'
TEST PIT NO.: TP-SM2-1S



ELEVATION / DEPTH	SOIL SYMBOLS, SAMPLER SYMBOLS, AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)
			FILL: Gray to reddish brown, silty sandy gravel, fine to medium, moist, (0'-2'). Dark gray, silty sand, fine to medium, with construction debris (concrete, metal, wood), moist, (2'-7.5').		
			SLUDGE: Dark gray to black clayey sand, fine to medium, very moist. Thin layer of lime above sludge.	B-1	8

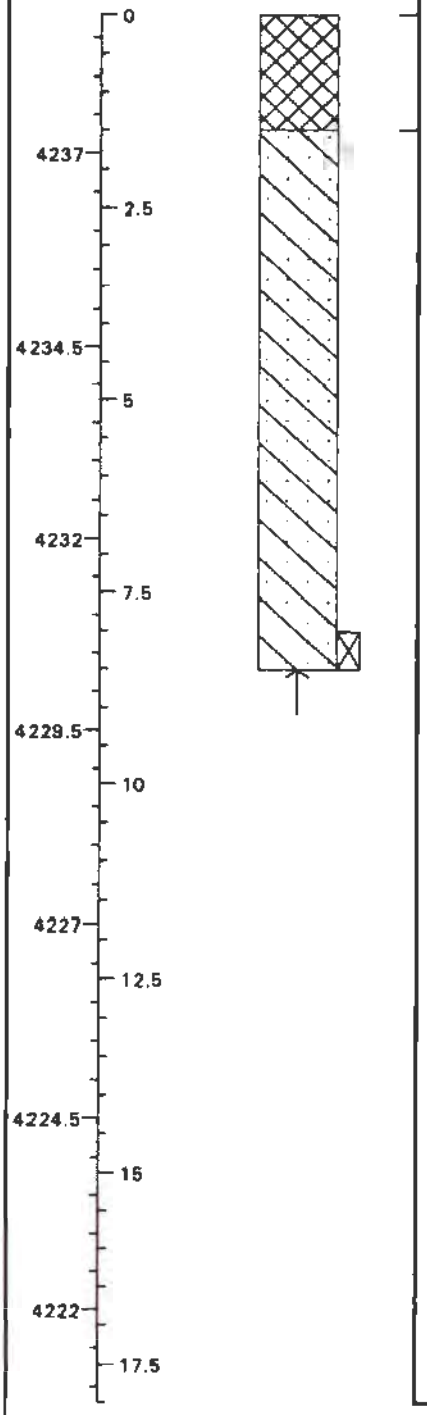
South end of TP-SM2-1

TEST PIT LOG

TEST PIT NO.: TP-SM2-1N

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO STEEL COMPANY
LOCATION: SWMU 2, South Boundry
EQUIPMENT: Backhoe (Track Mount)
GS ELEV.: 4238.8
DEPTH TO WATER: Not encountered

PROJECT NO.: 1104
DATE: 6-10-91
LOGGED BY: DCH
PIT WIDTH: 18'
PIT LENGTH: 3.5'
TEST PIT NO.: TP-SM2-1N



ELEVATION / DEPTH	SOIL SYMBOLS, SAMPLER SYMBOLS, AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)
			FILL: Gray & reddish brown, slag, silty sandy gravel, moist.		
		CL	CLAYEY SAND: Dark gray, fine to medium, moist.		
			...grades to gray.		
				B-1	8

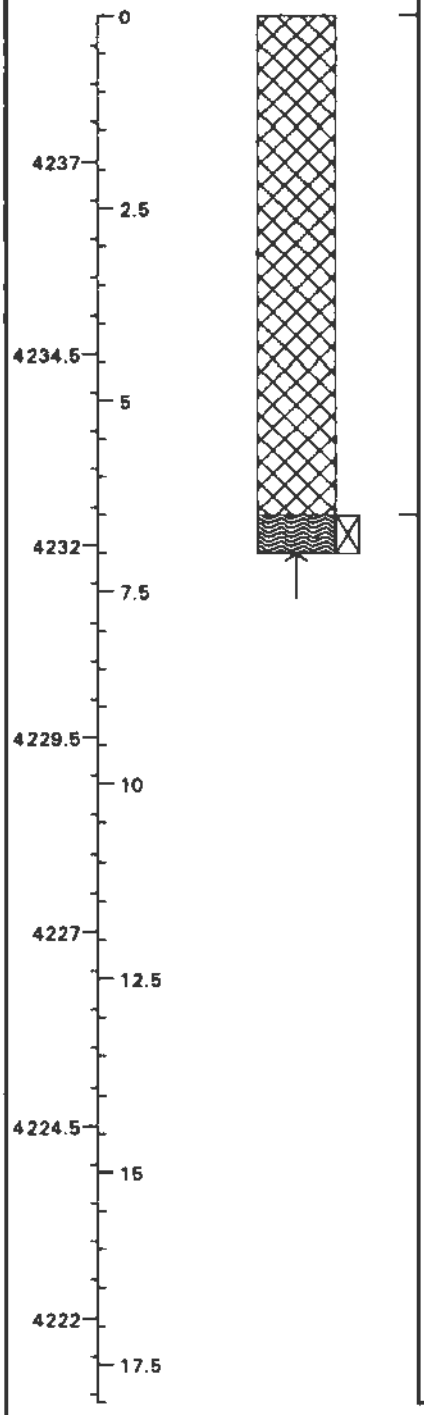
North end of TP-SM2-1

TEST PIT LOG

TEST PIT NO.: TP-SM2-2W

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO STEEL COMPANY
LOCATION: SWMU 2, East Boundary
EQUIPMENT: Backhoe (Track Mount)
GS ELEV.: 4238.9
DEPTH TO WATER: Not encountered

PROJECT NO.: 1104
DATE: 6-10-91
LOGGED BY: DCH
PIT WIDTH: 3.5'
PIT LENGTH: 20'
TEST PIT NO.: TP-SM2-2W



ELEVATION / DEPTH	SOIL SYMBOLS, SAMPLER SYMBOLS, AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)
			FILL: Reddish brown, silty sandy gravel, moist, (0'-1'). Dark gray, silty sand with construction debris (bricks, metal, wood), moist, (1'-6').		
			SLUDGE: Dark gray to black clayey sand, trace green crystals, very moist. Thin layer of lime above sludge.	B-1	6.5

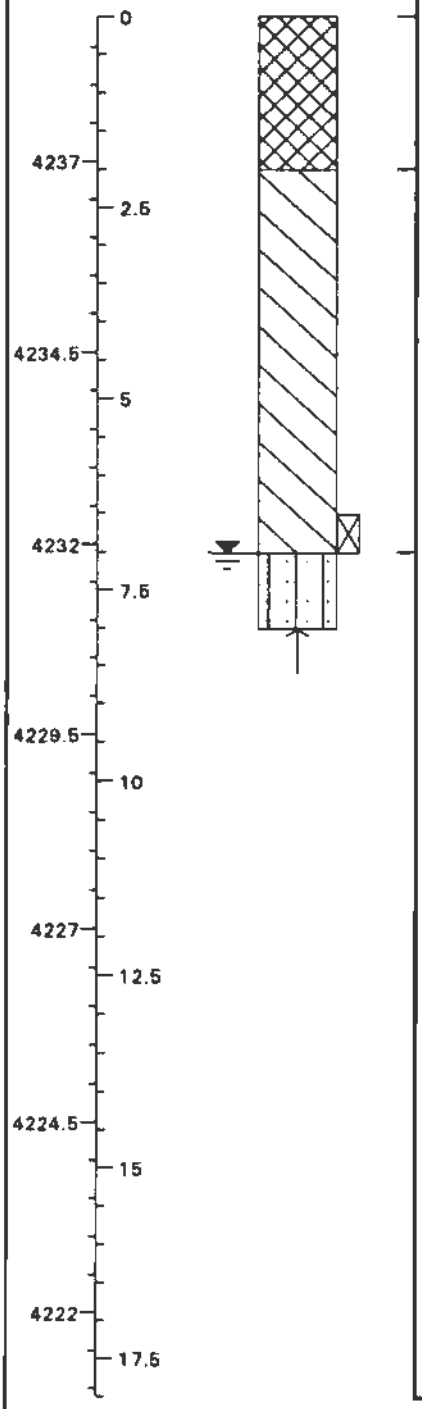
West end of TP-SM2-2

TEST PIT LOG

TEST PIT NO.: TP-SM2-2E

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO STEEL COMPANY
LOCATION: SWMU 2, East Boundary
EQUIPMENT: Backhoe (Track Mount)
GS ELEV.: 4238.9
DEPTH TO WATER: 7'

PROJECT NO.: 1104
DATE: 6-10-91
LOGGED BY: DCH
PIT WIDTH: 3.5'
PIT LENGTH: 20'
TEST PIT NO.: TP-SM2-2E



ELEVATION / DEPTH	SOIL SYMBOLS, SAMPLER SYMBOLS, AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)
			FILL: Reddish brown, silty sandy gravel, moist.		
		CL	SILTY CLAY: Dark gray, very sandy, fine to medium, moist.		
			...grades to tan, less sandy.		
				B-1	6.5
		SM	SILTY SAND: Greenish gray, fine to medium, clayey, wet.		

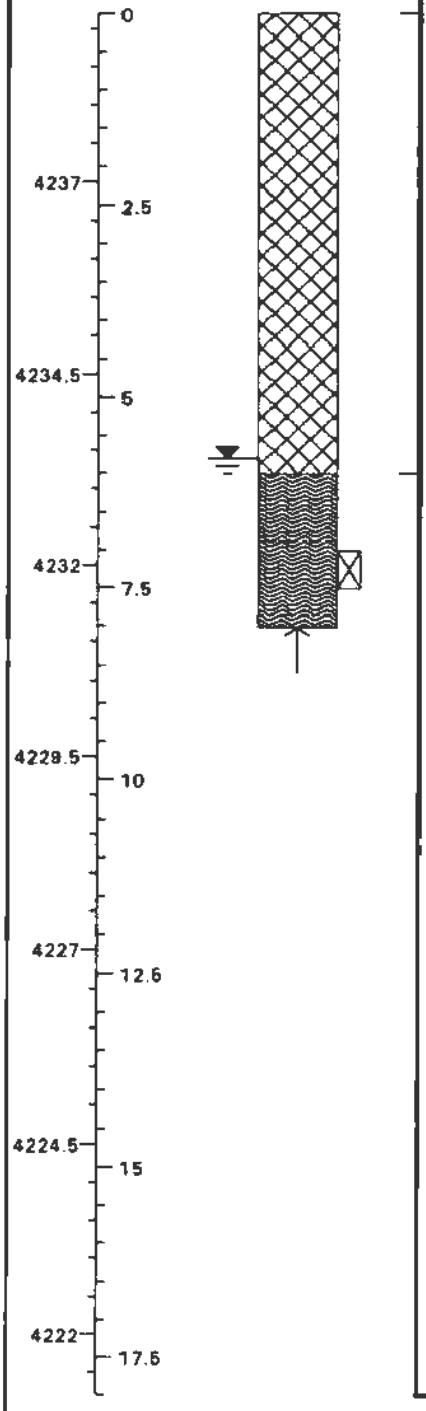
East end of TP-SM2-2

TEST PIT LOG

TEST PIT NO.: TP-SM2-3N

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO STEEL COMPANY
LOCATION: SWMU 2, South Boundary
EQUIPMENT: Backhoe (Track Mount)
GS ELEV.: 4239.2
DEPTH TO WATER: 5.8'

PROJECT NO.: 1104
DATE: 6-10-91
LOGGED BY: DCH
PIT WIDTH: 3.5'
PIT LENGTH: 19'
TEST PIT NO.: TP-SM2-3N



ELEVATION / DEPTH	SOIL SYMBOLS, SAMPLER SYMBOLS, AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)
			FILL: Reddish brown, silty sandy gravel, moist, (0'-1'). Dark gray sandy clay, with construction debris (concrete,wood, metel), moist, (1'-6').		
			SLUDGE: Dark gray to black, clayey sand, trace green crystals, wet. Thin layer of lime above sludge.	B-1	7

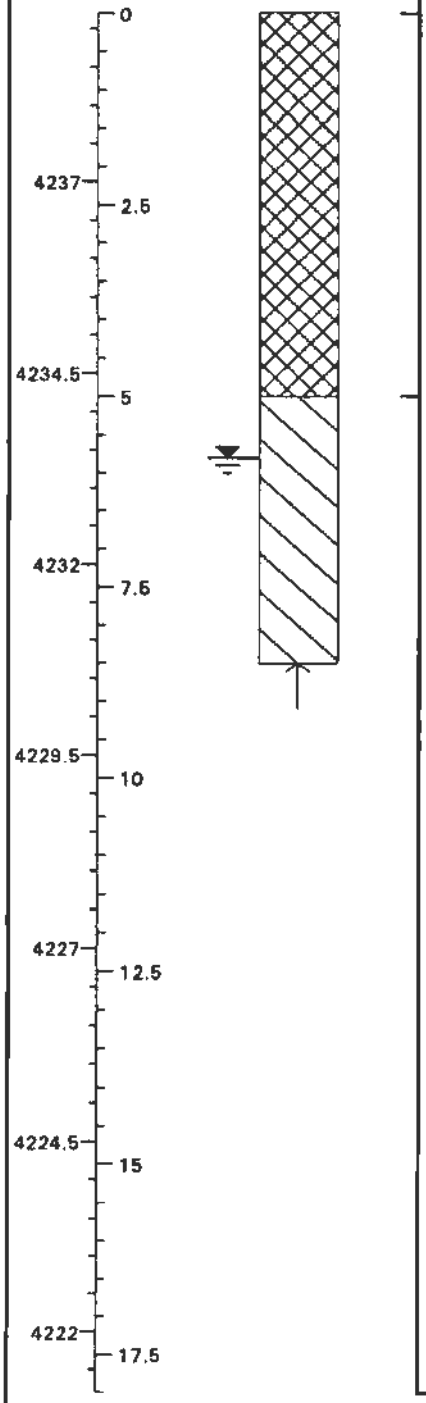
North end of TP-SM2-3

TEST PIT LOG

TEST PIT NO.: TP-SM2-3S

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO STEEL COMPANY
LOCATION: SWMU 2, South Boundary
EQUIPMENT: Backhoe (Track Mount)
GS ELEV.: 4239.2
DEPTH TO WATER: 5.8'

PROJECT NO.: 1104
DATE: 6-10-91
LOGGED BY: DCH
PIT WIDTH: 3.5'
PIT LENGTH: 19'
TEST PIT NO.: TP-SM2-3S



ELEVATION / DEPTH	SOIL SYMBOLS, SAMPLER SYMBOLS, AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)
			FILL: Red, dark brown & gray, sandy clay, with construction debris (concrete, wood, bricks, metal), moist.		
		CL	SILTY CLAY: Brown, sandy, fine to medium, moist. ...grades wet at 6'	B-1	8

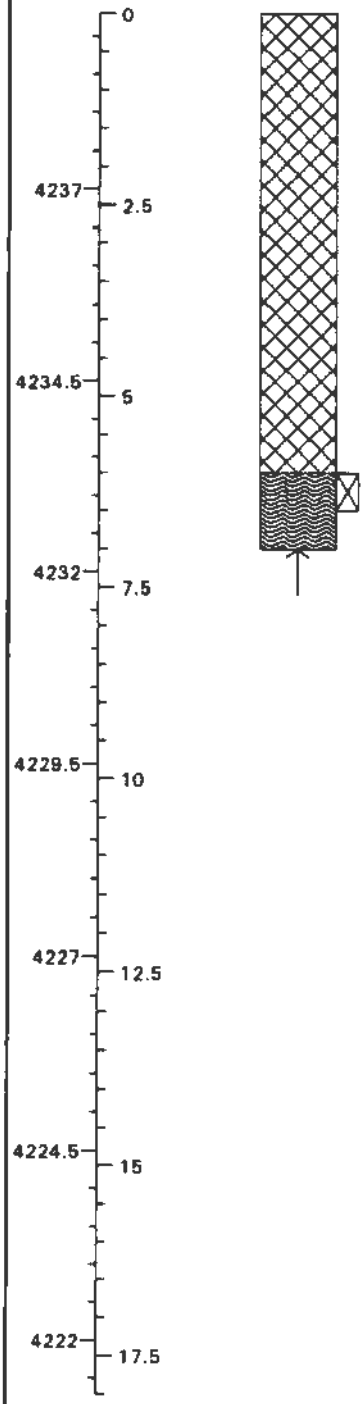
South end of TP-SM2-3

TEST PIT LOG

TEST PIT NO.: TP-SM2-4E

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO STEEL COMPANY
LOCATION: SWMU 2, West Boundary
EQUIPMENT: Backhoe (Track Mount)
GS ELEV.: 4239.3
DEPTH TO WATER: Not encountered

PROJECT NO.: 1104
DATE: 6-10-91
LOGGED BY: DCH
PIT WIDTH: 3.5'
PIT LENGTH: 22'
TEST PIT NO.: TP-SM2-4E



ELEVATION / DEPTH	SOIL SYMBOLS, SAMPLER SYMBOLS, AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)
			FILL: Reddish brown, silty sandy gravel, moist, (0'-1'). Dark gray silty sand, with construction debris (concrete, wood, metal), moist.		
			SLUDGE: Dark gray to black, clayey sand, trace green crystals, very moist.	B-1	6

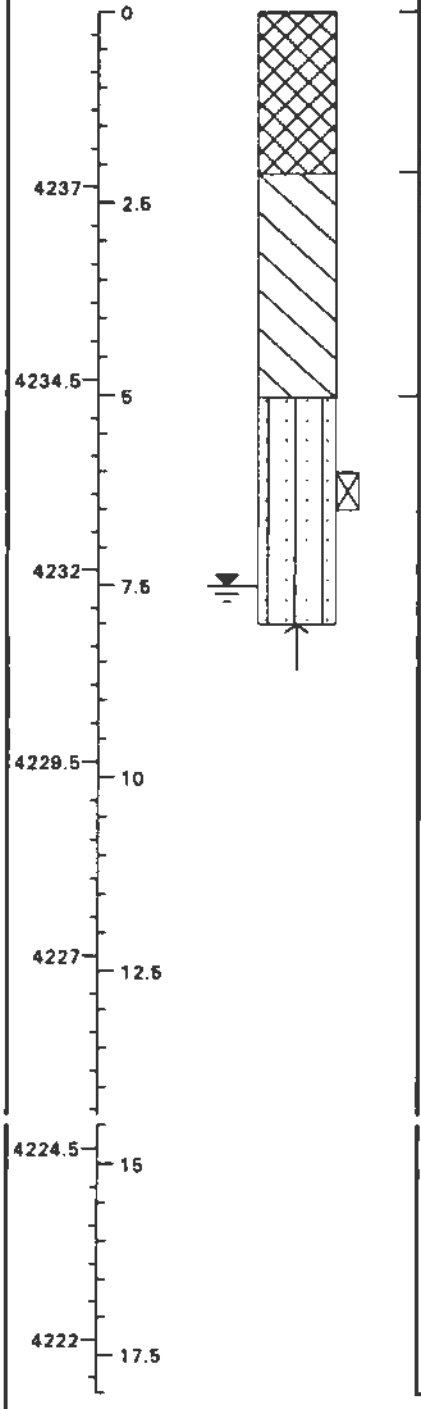
East end of TP-SM2-4

TEST PIT LOG

TEST PIT NO.: TP-SM2-4W

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO STEEL COMPANY
LOCATION: SWMU 2, West Boundary
EQUIPMENT: Backhoe (Track Mount)
GS ELEV.: 4239.3
DEPTH TO WATER: 7.5'

PROJECT NO.: 1104
DATE: 6-10-91
LOGGED BY: DCH
PIT WIDTH: 3.5'
PIT LENGTH: 22'
TEST PIT NO.: TP-SM2-4W



ELEVATION / DEPTH	SOIL SYMBOLS, SAMPLER SYMBOLS, AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)
			FILL: Reddish brown, silty sandy gravel, slightly moist.		
		CL	SILTY CLAY: Dark gray to gray, sandy, fine to medium, moist.		
		SM	SILTY SAND: Dark gray to gray, fine to medium. moist.	B-1	6
			...grades wet.		

West end of TP-SM2-4

TEST PIT LOGS

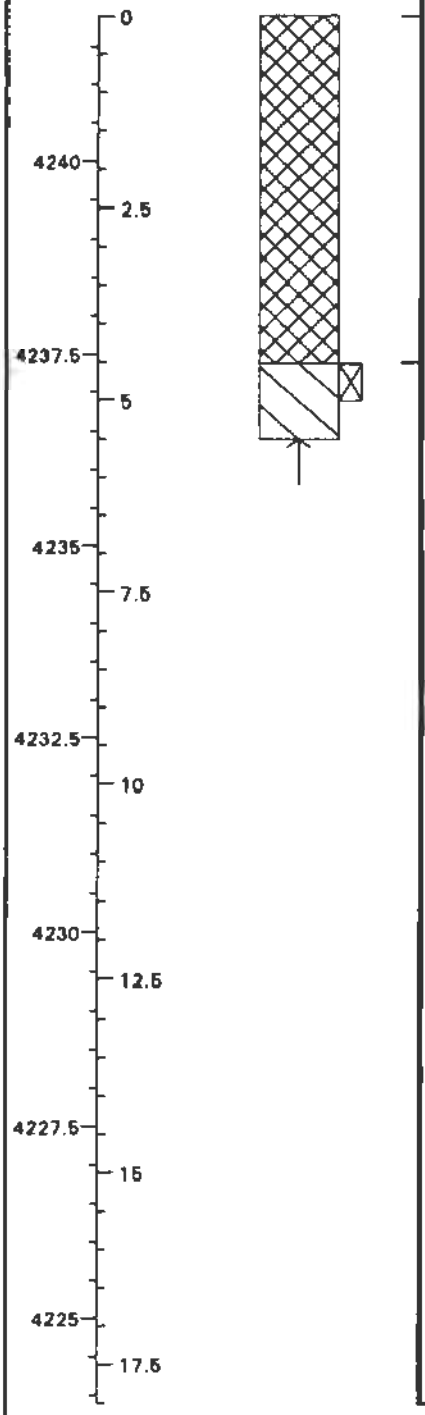
SOLID WASTE MANAGEMENT UNIT #3

TEST PIT LOG

TEST PIT NO.: TP-SM3-1

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO STEEL COMPANY
LOCATION: SWMU 3
EQUIPMENT: Backhoe (Rubber Tire)
GS ELEV.: 4241.9
DEPTH TO WATER: Not encountered

PROJECT NO.: 1104
DATE: 7-26-91
LOGGED BY: DCH
PIT WIDTH: 2.5'
PIT LENGTH: 14'
TEST PIT NO.: TP-SM3-1



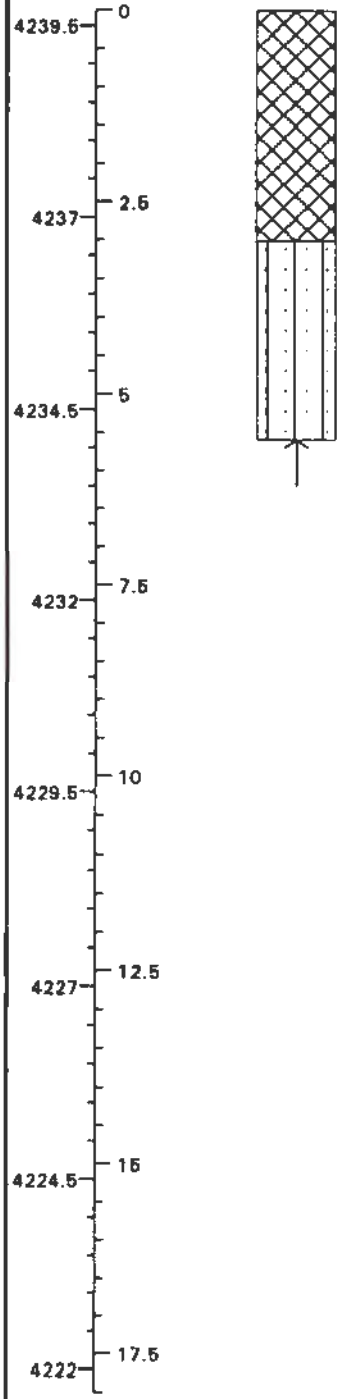
ELEVATION / DEPTH	SOIL SYMBOLS, SAMPLER SYMBOLS, AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)
			FILL: Tan, gray & brown, silty sandy gravel, moist, (0'-1'). Gravely sand, moist, (1'-4.5').		
		CL	SILTY CLAY: Tan, fine to medium, moist.	B-1	5

TEST PIT LOG

TEST PIT NO.: TP-SM3-2

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO STEEL COMPANY
LOCATION: SWMU 3
EQUIPMENT: Backhoe (Rubber Tire)
GS ELEV.: 4239.7
DEPTH TO WATER: Not encountered

PROJECT NO.: 1104
DATE: 7-26-91
LOGGED BY: DCH
PIT WIDTH: 2.5'
PIT LENGTH: 21'
TEST PIT NO.: TP-SM3-2



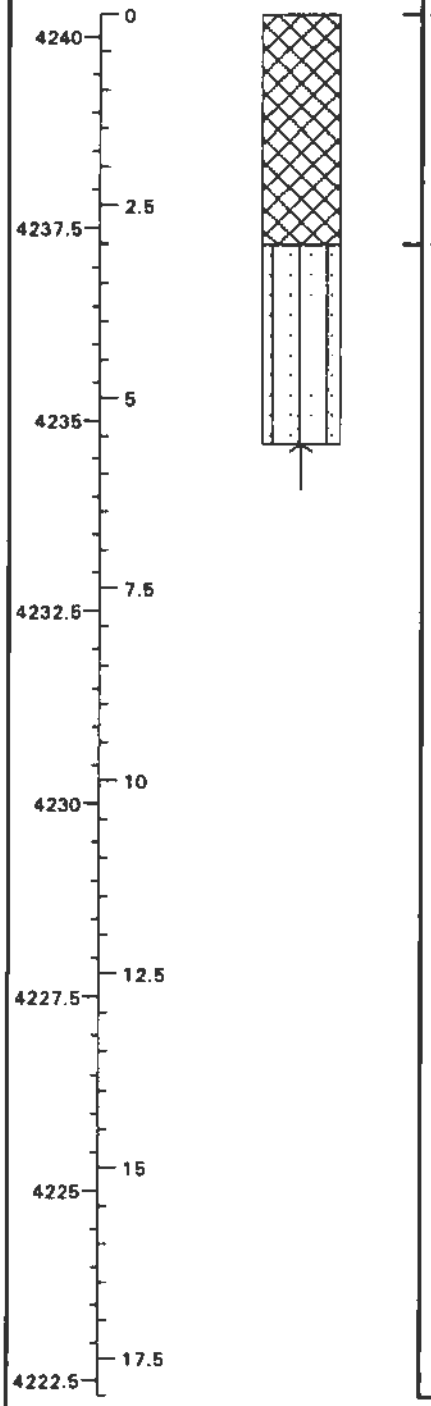
ELEVATION / DEPTH	SOIL SYMBOLS, SAMPLER SYMBOLS, AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)
			FILL: Tan, gray & brown, silty sandy gravel, moist.		
		SM	SILTY SAND: Black, fine, moist.		

TEST PIT LOG

TEST PIT NO.: TP-SM3-3

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO STEEL COMPANY
LOCATION: SWMU 3
EQUIPMENT: Backhoe (Rubber Tire)
GS ELEV.: 4240.3
DEPTH TO WATER: Not encountered

PROJECT NO.: 1104
DATE: 7-26-91
LOGGED BY: DCH
PIT WIDTH: 2.5'
PIT LENGTH: 21'
TEST PIT NO.: TP-SM3-3



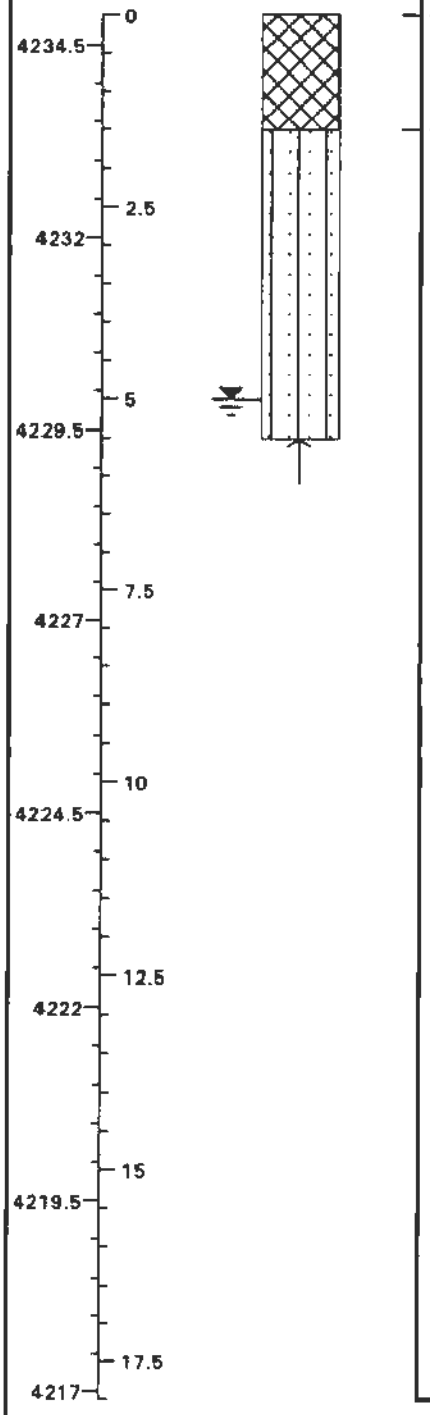
ELEVATION / DEPTH	SOIL SYMBOLS, SAMPLER SYMBOLS, AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)
			FILL: Tan, gray & brown, silty sandy gravel, moist.		
		SM	SILTY SAND: Black, fine, moist.		

TEST PIT LOG

TEST PIT NO.: TP-SM3-4

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO STEEL COMPANY
LOCATION: SWMU 3
EQUIPMENT: Backhoe (Rubber Tire)
GS ELEV.: 4234.9
DEPTH TO WATER: 5'

PROJECT NO.: 1104
DATE: 7-26-91
LOGGED BY: DCH
PIT WIDTH: 2.5'
PIT LENGTH: 45.4'
TEST PIT NO.: TP-SM3-4



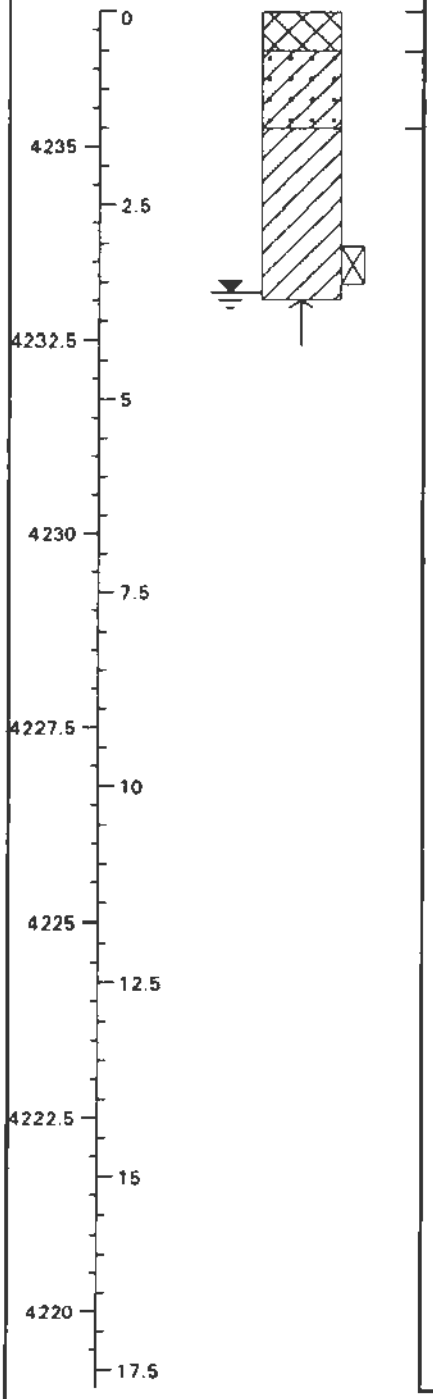
ELEVATION / DEPTH	SOIL SYMBOLS, SAMPLER SYMBOLS, AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)
			FILL: Gray & brown, silty sandy gravel, moist.		
		SM	SILTY SAND: Black, fine, moist.		
			...grades to gray.		
			...grades to wet.		

TEST PIT LOG

TEST PIT NO.: TP-SM3-5

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO, Inc.
LOCATION: SWMU 3
EQUIPMENT: Trackhoe
GS ELEV.: 4236.74
DEPTH TO WATER: 3.6'

PROJECT NO.: 1104
DATE: 4-19-94
LOGGED BY: DEW
PIT WIDTH: 3'
PIT LENGTH: 17'
TEST PIT NO.: TP-SM3-5



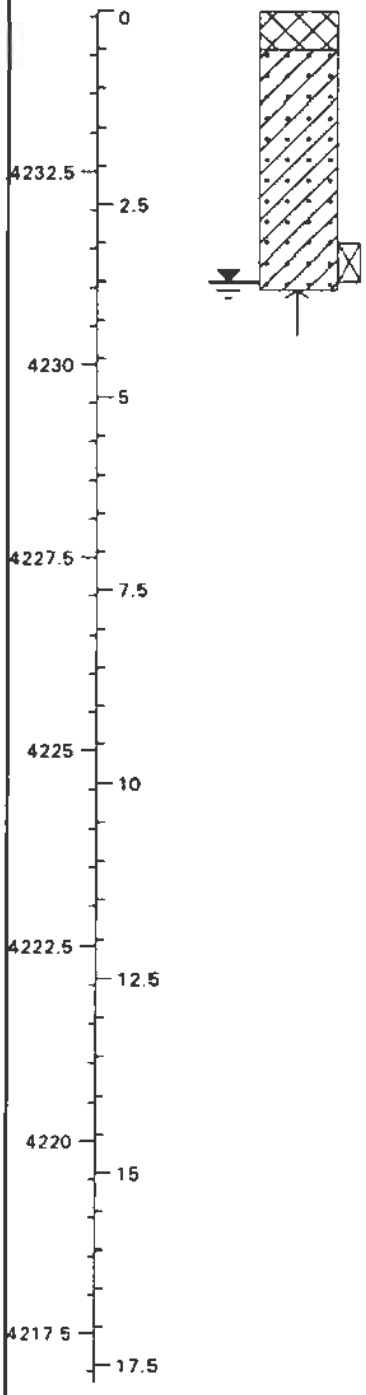
ELEVATION / DEPTH	SOIL SYMBOLS, SAMPLER SYMBOLS, AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)
		GM	SILTY GRAVEL: Gray & brown, silty, sandy, moist (Fill).		
		CL	SANDY CLAY: Black, fine, roots, moist to very moist.		
		CL	SILTY CLAY: Brown to gray, roots, wet.		
				TP-SM3-5	3

TEST PIT LOG

TEST PIT NO.: TP-SM3-6

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO, Inc.
LOCATION: SWMU 3
EQUIPMENT: Trackhoe
GS ELEV.: 4234.58
DEPTH TO WATER: 3.5'

PROJECT NO.: 1104
DATE: 4-19-94
LOGGED BY: DEW
PIT WIDTH: 10'
PIT LENGTH: 13'
TEST PIT NO.: TP-SM3-6

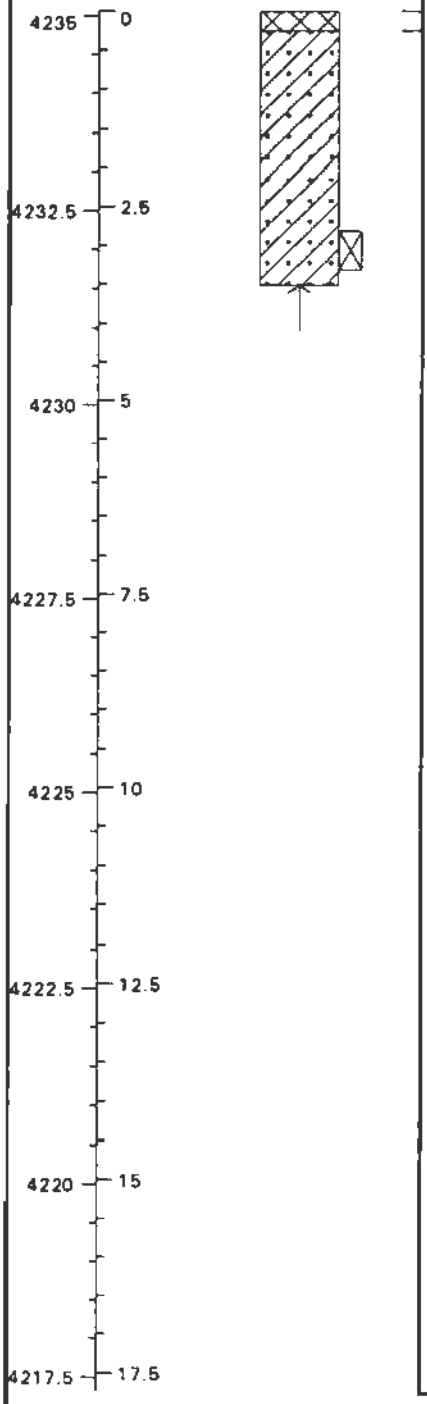


ELEVATION / DEPTH	SOIL SYMBOLS, SAMPLER SYMBOLS, AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)
		GM	SILTY GRAVEL: Gray & brown, silty, sandy, moist (Fill).		
		CL	SANDY CLAY: Black, very sandy, fine, roots, moist to very moist.		
				TP-SM3-6	3

TEST PIT LOG
TEST PIT NO.: TP-SM3-7

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO, Inc.
LOCATION: SWMU 3
EQUIPMENT: Trackhoe
GS ELEV.: 4235.06
DEPTH TO WATER: None encountered

PROJECT NO.: 1104
DATE: 4-19-94
LOGGED BY: DEW
PIT WIDTH: 7'
PIT LENGTH: 12'
TEST PIT NO.: TP-SM3-7



ELEVATION / DEPTH	SOIL SYMBOLS, SAMPLER SYMBOLS, AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)
		GM	SILTY GRAVEL: Gray & brown, silty, sandy, moist (Fill).		
		CL	SANDY CLAY: Black, fine, roots, moist to very moist.		
				TP-SM3-7	2.8

TEST PIT LOGS

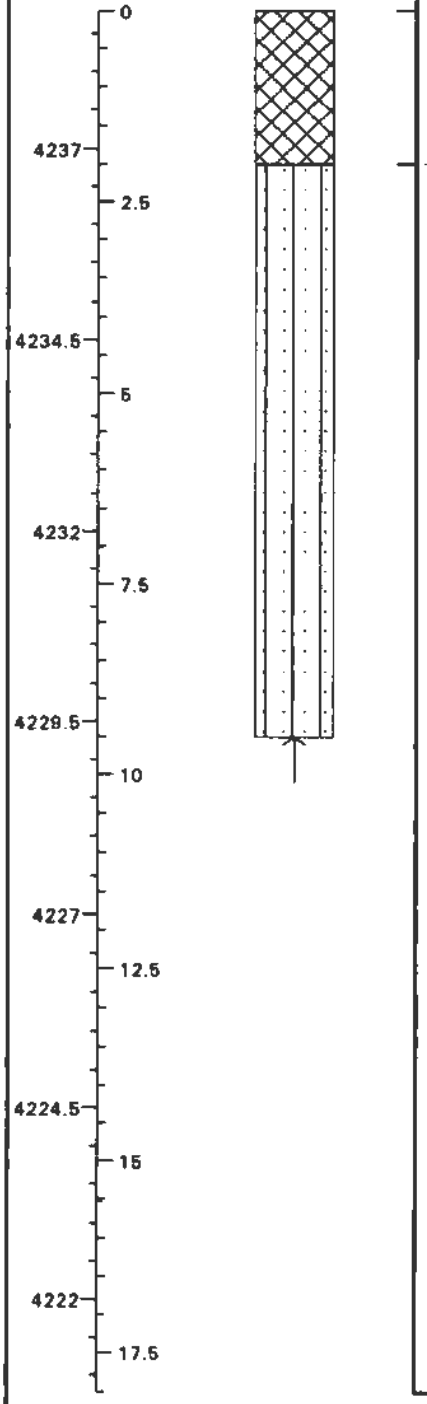
SOLID WASTE MANAGEMENT UNIT #6

TEST PIT LOG

TEST PIT NO.: TP-SM6-1

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO STEEL COMPANY
LOCATION: SWMU 6
EQUIPMENT: Backhoe (Rubber Tire)
GS ELEV.: 4238.8
DEPTH TO WATER: Not encountered

PROJECT NO.: 1104
DATE: 7-29-91
LOGGED BY: DCH
PIT WIDTH: 2.5'
PIT LENGTH: 10'
TEST PIT NO.: TP-SM6-1



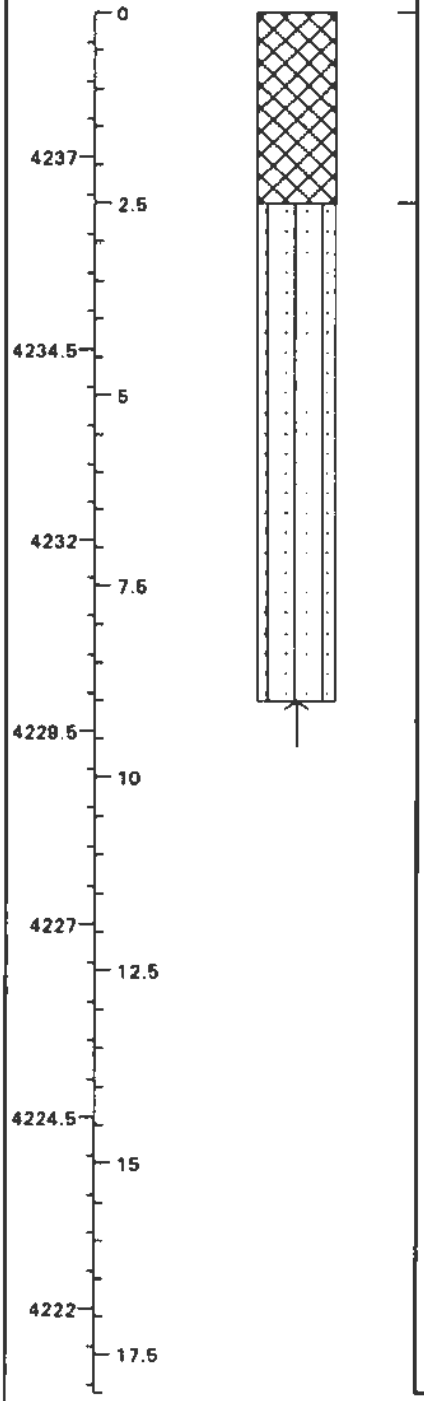
ELEVATION / DEPTH	SOIL SYMBOLS, SAMPLER SYMBOLS, AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)
			FILL: Gray & brown, silty sandy gravel, moist.		
		SM	SILTY SAND: Dark gray to dark brown, fine, moist.		
			...grades to dark brown.		

TEST PIT LOG

TEST PIT NO.: TP-SM6-2

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO STEEL COMPANY
LOCATION: SWMU 6
EQUIPMENT: Backhoe (Rubber Tire)
GS ELEV.: 4238.9
DEPTH TO WATER: Not encountered

PROJECT NO.: 1104
DATE: 7-29-91
LOGGED BY: DCH
PIT WIDTH: 2.5'
PIT LENGTH: 9.5'
TEST PIT NO.: TP-SM6-2



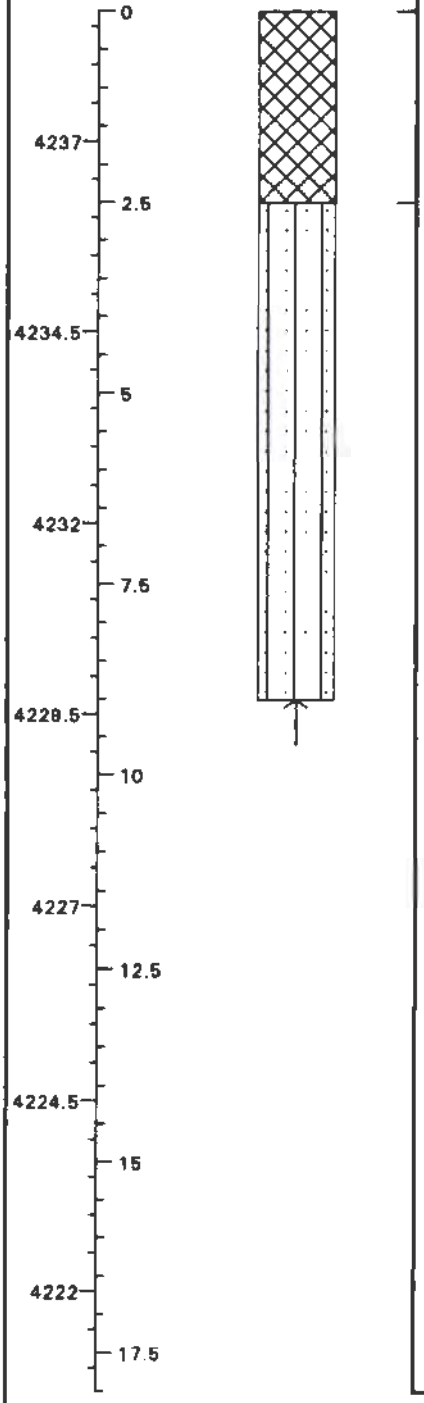
ELEVATION / DEPTH	SOIL SYMBOLS, SAMPLER SYMBOLS, AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)
			FILL: Gray & brown, silty sandy gravel, moist.		
		SM	SILTY SAND: Tan, fine to coarse, moist.		
			...grades to black.		
			...grades to gray.		

TEST PIT LOG

TEST PIT NO.: TP-SM6-3

PROJECT: SYRO RFI
CLIENT/OWNER: SYRO STEEL COMPANY
LOCATION: SWMU 6
EQUIPMENT: Backhoe (Rubber Tire)
GS ELEV.: 4238.7
DEPTH TO WATER: Not encountered

PROJECT NO.: 1104
DATE: 7-29-91
LOGGED BY: DCH
PIT WIDTH: 2.5'
PIT LENGTH: 9.5'
TEST PIT NO.: TP-SM6-3



ELEVATION / DEPTH	SOIL SYMBOLS, SAMPLER SYMBOLS, AND FIELD TEST DATA	USCS	Description	Sample Number	Sample Depth (ft)
			FILL: Gray & brown silty sandy gravel, moist.		
		SM	SILTY SAND: Tan, fine to coarse, moist.		
			...grades to black.		
			...grades to gray.		

KEY TO SYMBOLS

Symbol	Description
Strata symbols	
	Fill
	Sandy clay
	Silty sand
	Silty clay
	Sludge

Symbol	Description
Soil Samplers	
	Bag sample

Misc. Symbols

	Test pit completion depth
	Water table

Notes:

1. Test pits were excavated on 6/3/91 through 7/6/91, using a track mounted rubber tire backhoe.
2. Selected soil samples were collected from the test pits for chemical analysis.
3. When free water was encountered in the test pits a water level measurement was taken and shown on the test pit logs.
4. Test pit locations were surveyed using existing Syro Datums
5. These logs are subject to the limitations, conclusions, and recommendations in this report.

KEY TO SYMBOLS

Symbol	Description
Strata symbols	
	Silty gravel (Fill)
	Silty sand
	Silty clay
	Sludge
	Sandy clay
Misc. Symbols	
	Test pit completion depth
	Water table

Symbol	Description
Soil Samplers	
	Bag sample

Notes:

1. Test pits were excavated on 6/3/91 through 7/6/91 and on 4/19/94, using a trackhoe and rubber tire backhoe.
2. Selected soil samples were collected from the test pits for chemical analysis.
3. When free water was encountered in the test pits a water level measurement was taken and shown on the test pit logs.
4. Test pit locations were surveyed using existing Syro Datums
5. These logs are subject to the limitations, conclusions, and recommendations in this report.

PENETROMETER LOGS

PENETROMETER LOG

HYDROPUNCH HOLE NO: DH-1

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: May 22, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4236.48
HOLE DIAMETER: 7.25 inches
LOGGED BY: D.H.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Fill, gravel, sand, clay			
5	Clay with sand lenses	WS-1	8*	
10	Occasional layering		12-13	0
24	Clay	WS-2	22.5-23.5	10
35	Sand	WS-3	36-37	

HYDROPUNCH HOLE NO: DH-2

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: May 22, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4229.97
HOLE DIAMETER: 7.25 inches
LOGGED BY: D.H.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Clay			
7	Clay with sand lenses	WS-1	8-9	1000
12	Sand, possible flowing sand	WS-2	13-14	1000
19	Clay with sand lenses			
21	Sand			
24	Clay with sand lenses	WS-3	22-23	1000
25	Sand	WS-4	26.5-27.5	1000
30	Clay			
33	Sand	WS-5	33-34	1000

* Sample taken from auger.

PENETROMETER LOG

HYDROPUNCH HOLE NO: DH-3

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: May 23, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4227.68
HOLE DIAMETER: 7.25 inches
LOGGED BY: D.H.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Clay			
5	Clay with sand lenses	WS-1	7	1000
8	Clay			
11	Sand, hard			
13	Clay and sand layering	WS-2	12-13	1000
17	Sand, hard	WS-3	18-19	1000
20	Alternating sand, clay layers			
23	Sand, hard	WS-4	23-24	1000
26	Clay			
30	Sand, hard	WS-5	30.5-31.5	1000

HYDROPUNCH HOLE NO: DH-4

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: May 1, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4226.43
HOLE DIAMETER: 7.25 inches
LOGGED BY: D.H.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Fill, gravel, sand			
3.5	Silty sand	WS-1	3.5-4.3	900
5	Clay			
10	Silty sand		11.5-12	0
14	Sand	WS-2	14-15	900
19	Clay	WS-3	18.5-19.5	600
25	Sand	WS-4	25-26	1000
26	Clay, sand			
30	Sand	WS-5	30.5-31.5	1000

PENETROMETER LOG

HYDROPUNCH HOLE NO: DH-6

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: May 14, 1991
RILL RIG: Acker
GROUND SURFACE ELEVATION: 4224.80
HOLE DIAMETER: 7.25 inches
LOGGED BY: P.C.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Clay		4.5-5	0
5	Sand	WS-1	5.5-6	500
9	Clay with sand lenses	WS-2	8.5	700
13	Sand		13-14	0
18	Clay	WS-3	16.2-17.2	700
27	Sand	WS-4	27.3-28.3	200

HYDROPUNCH HOLE NO: DH-7

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: May 30, 1991
RILL RIG: Acker
GROUND SURFACE ELEVATION: 4233.48
HOLE DIAMETER: 7.25 inches
LOGGED BY: P.C.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Fill, gravel, sand, clay			
5	Sand layers	WS-1	5*	1000
8	Clay layers	WS-2	7-8	700
13	Sand		13-14	0
14	Clay	WS-3	15	1000
23	Sand		23-24	0
24	Clay			
34	Sand	WS-4	34.1-35.1	1000

* Sample taken from auger.

PENETROMETER LOG

HYDROPUNCH HOLE NO: DH-8

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: May 24, 1991
RILL RIG: Acker
GROUND SURFACE ELEVATION: 4234.65
HOLE DIAMETER: 7.25 inches
LOGGED BY: D.H.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Fill, gravel, sand			
6	Clay with sand lenses	WS-1	7*	1000
11	Sand, flowing sand	WS-2	12-13	1000
18	Sand	WS-3	18-19	1000
22	Sand	WS-4	21-22	1000

HYDROPUNCH HOLE NO: DH-9

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: May 30, 1991
RILL RIG: Acker
GROUND SURFACE ELEVATION: 4227.82
HOLE DIAMETER: 7.25 inches
LOGGED BY: P.C.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Fill, gravel, sand			
5	Clay	WS-1	5*	1000
9.5	Sand	WS-2	9.5-10.5	1000
10.5	Clay			
13	Sand	WS-3	13.3-14.3	1000
14.5	Clay			
17.5	Sand	WS-4	17.8-18.8	1000
24	Clay	WS-5	23-24	1000
32	Sand	WS-6	32-33	1000

* Sample taken from auger.

PENETROMETER LOG

HYDROPUNCH HOLE NO: DH-10

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: June 5, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4225.18
HOLE DIAMETER: 7.25 inches
LOGGED BY: P.C.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Top soil			
3	Clay	WS-1	5*	1000
9	Sandy clay	WS-2	9.8-10.8	1000
11	Clay		15.8-16.8	0
15	Sandy clay	WS-3	15*	1000
17	Clay			
21	Sandy clay		21.9-22.9	0

HYDROPUNCH HOLE NO: DH-11

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: June 3, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4225.48
HOLE DIAMETER: 7.25 inches
LOGGED BY: P.C.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Clay	WS-1	5.5	500
5	Sand			
6	Clay	WS-2	10.5-11.5	500
10	Sandy clay	WS-3	14-15	100
12	Clay			
18	Sandy clay	WS-4	18.3-19.3	50
20	Clay		27-28	0
33	Sand	WS-5	33-34	700

* Sample taken from auger.

PENETROMETER LOG

HYDROPUNCH HOLE NO: DH-12

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: May 2, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4226.33
HOLE DIAMETER: 7.25 inches
LOGGED BY: P.C.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Clay			
3.5	Sandy clay	WS-1	5.5	1000
6	Clay			
12	Sand	WS-2	12-13	1000
13	Clay			
17	Sand	WS-3	17.5-18.5	800
18.5	Clay			
20	Sand	WS-4	20-21	700
21	Clay		27-28	0
30	Sand	WS-5	30-31	600

HYDROPUNCH HOLE NO: DH-13

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: April 30, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4227.18
HOLE DIAMETER: 7.25 inches
LOGGED BY: D.H.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Clay		3.5	0
3.5	Sand		4.5-5.5	0
5	Silty sand	WS-1	3.5*	1000
6	Clay	WS-2	12-13	800
12	Silty sand	WS-3	17-18	100
15	Silty sand	WS-4	27.5-28.5	1000

* Sample taken from auger.

PENETROMETER LOG

HYDROPUNCH HOLE NO: DH-14

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: April 30, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4228.91
HOLE DIAMETER: 7.25 inches
LOGGED BY: D.H.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Clay			
5	Silty sand	WS-1	6	1000
6	Clay		9	0
9	Clay	WS-2	9	1000
15	Clay		15-18	0
18	Clay	WS-3	15	1000
19	Clay	WS-4	19-20	7

HYDROPUNCH HOLE NO: DH-15

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: April 24, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4230.58
HOLE DIAMETER: 7.25 inches
LOGGED BY: D.H.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Clayey sand			
4	Clay	WS-1	5.0	500
5	Silty sand			
6	Clay			
9	Sand	WS-2	11.5	500

PENETROMETER LOG

HYDROPUNCH HOLE NO: DH-16

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: April 17, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4231.50
HOLE DIAMETER: 7.25 inches
LOGGED BY: M.T.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Clayey sand	WS-1	2.5*	1000
3.7	Clay			
4.7	Silty sand			
6.1	Clay	WS-2	10.5	1000
7.2	Sand	WS-3	16	1000
29.7	Clay, sand	WS-4	20	1000

HYDROPUNCH HOLE NO: DH-17

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: June 6, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4224.0
HOLE DIAMETER: 7.25 inches
LOGGED BY: D.H.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Clay			
4	Clayey sand	WS-1	5*	1000
6	Clay			
8	Clayey sand	WS-2	8-9	500
9.5	Clay	WS-3	15.3-16.3	5
15	Sandy clay	WS-4	15	1000
16.5	Clay			
22	Sandy clay	WS-5	22-23	2
23	Clay			
28	Sand	WS-6	28-29	10

* Sample taken from auger.

PENETROMETER LOG

HYDROPUNCH HOLE NO: DH-18

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: May 6, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4224.16
HOLE DIAMETER: 7.25 inches
LOGGED BY: P.C.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Clay	WS-1	5*	1000
10.5	Sand	WS-2	10.5-11.5	700
11.5	Clay			
13.5	Sand			
14.5	Clay		18.5-19.5	0
30.5	Sand	WS-3	30.5-31.5	700

HYDROPUNCH HOLE NO: DH-19

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: May 7, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4226.0
HOLE DIAMETER: 7.25 inches
LOGGED BY: P.C.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Clay		3.5-4	0
4	Clay	WS-1	5*	1000
11	Sand	WS-2	11-12	20
12	Clay			
16	Sand	WS-3	16-17	1000
17	Clay			
19	Sand	WS-4	19-20	1000
20	Clay			
25.7	Sand		25.7-26.7	0
26.7	Clay	WS-5	29.3-30.3	1000
29.3	Sand			

* Sample taken from auger.

PENETROMETER LOG

HYDROPUNCH HOLE NO: DH-20

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: May 15,1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4225.48
HOLE DIAMETER: 7.25 inches
LOGGED BY: P.C.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Clay		3-6	0
6	Clay	WS-1	5*	1000
8	Sandy clay	WS-2	8-9	200
9	Clay			
15.5	Sand		15.5-16.5	0
16.5	Clay			
26.5	Sand	WS-3	26.5-27.5	1000

HYDROPUNCH HOLE NO: DH-21

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: May 15, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4226.94
HOLE DIAMETER: 7.25 inches
LOGGED BY: P.C.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Clay		4.5-5	0
4.5	Clay		5.5-6	0
9	Clay		6.5-7	0
10	Clay		7.7-8.7	0
15	Clay	WS-1	5*	1000
18	Sand	WS-2	18-19	800

* Sample taken from auger.

PENETROMETER LOG

HYDROPUNCH HOLE NO: DH-22

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: May 15, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4229.31
HOLE DIAMETER: 7.25 inches
LOGGED BY: P.C.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Clay			
5	Sand	WS-1	5-5.5	500
5.5	Sand			
9.2	Sand	WS-2	9.2-10.2	800

HYDROPUNCH HOLE NO: DH-23

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: May 16, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4225.45
HOLE DIAMETER: 7.25 inches
LOGGED BY: P.C.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Clay		5-6	0
5	Clay	WS-1	4*	1000
6	Clay			
8.7	Sand	WS-2	8.7-9.7	1000

* Sample taken from auger.

PENETROMETER LOG

HYDROPUNCH HOLE NO: DH-24

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: May 16, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4224.16
HOLE DIAMETER: 7.25 inches
LOGGED BY: P.C.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Clay		4-4.5	0
4	Silty sand	WS-1	5.5	700
5.5	Silty sand			
9	Sand	WS-2	9-10	1000
10	Clay			
16.1	Sand	WS-3	16.1-17.1	25
17.1	Clay			
26	Sand	WS-4	26-27	700

HYDROPUNCH HOLE NO: DH-25

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: May 17, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4225.86
HOLE DIAMETER: 7.25 inches
LOGGED BY: P.C.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Clay			
3	Clay		4.5-5	0
5	Clay	WS-1	7.4	500
7	Sand			
7.4	Clay			
11.5	Sand	WS-2	11.5-12.5	600
12.5	Silty sand			
17	Sand	WS-3	17-18	700
18	Silty sand			
23	Sand	WS-4	23-24	700
25	Sand	WS-5	25-26	1000
26	Silty sand		26.5-27.5	0

PENETROMETER LOG

HYDROPUNCH HOLE NO: DH-26

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: May 17, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4227.80
HOLE DIAMETER: 7.25 inches
LOGGED BY: P.C.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Clay			
4.5	Clay	WS-1	5*	1000
7.3	Sand	WS-2	7.3-8.3	500

HYDROPUNCH HOLE NO: DH-27

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: May 21, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4224.30
HOLE DIAMETER: 7.25 inches
LOGGED BY: D.H.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Clay	WS-1	5*	1000
4	Sand			
5.5	Clay			
9	Sand	WS-2	9-10	1000
11	Clay			
16	Sand	WS-3	16.7-17.7	5
17.5	Clay			
27	Sand	WS-4	27-28	1000

* Sample taken from auger.

PENETROMETER LOG

HYDROPUNCH HOLE NO: DH-28

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: May 21, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4222.65
HOLE DIAMETER: 7.25 inches
LOGGED BY: D.H.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Clay			
4	Sand	WS-1	5*	1000
5	Clay			
8	Sand	WS-2	8-9	1000
11	Clay			
16	Sand	WS-3	16-17	10
17	Clay			
25	Sand	WS-4	26.5-27.5	1000

HYDROPUNCH HOLE NO: DH-29

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: May 31, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4227.49
HOLE DIAMETER: 7.25 inches
LOGGED BY: P.C.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Silty sand			
4.5	Sand	WS-1	5*	1000
5	Clay			
10.5	Sand	WS-2	10.5-11.5	1000

* Sample taken from auger.

PENETROMETER LOG

HYDROPUNCH HOLE NO: DH-30

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: May 31, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4226.40
HOLE DIAMETER: 7.25 inches
LOGGED BY: P.C.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Clay			
3	Sand	WS-1	5*	1000
5	Clay			
10.1	Sand	WS-2	10.1-11.1	1000
11.1	Clay			
16.7	Sand	WS-3	16.7-17.7	1000
17.7	Clay			
30	Sand	WS-4	30.1-31.1	1000

HYDROPUNCH HOLE NO: DH-31

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: June 6, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4222.63
HOLE DIAMETER: 7.25 inches
LOGGED BY: D.H.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Sandy clay			
3.5	Clayey sand	WS-1	5*	1000
6	Clay			
10	Sand	WS-2	10-11	500
11	Clay			
13	Sand	WS-3	13-14	1000
14	Clay			
19.6	Sand	WS-4	19.6-20.6	1000
20.6	Clay			
28	Sand	WS-5	28-29	1000

* Sample taken from auger.

PENETROMETER LOG

HYDROPUNCH HOLE NO: DH-32

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: June 7, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4223.98
HOLE DIAMETER: 7.25 inches
LOGGED BY: D.H.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Sandy clay			
2	Silty clay			
4	Sand	WS-1	5*	1000
5	Clay	WS-2	7.5-8.5	4
8.5	Clay	WS-3	10	1000
16.5	Clay with sand lenses	WS-4	17-18	12
18	Clay			
30	Sand	WS-5	30-31	1000

HYDROPUNCH HOLE NO: DH-33

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: June 10, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4220.84
HOLE DIAMETER: 7.25 inches
LOGGED BY: P.C.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Clay			
4	Clay		5	0
5	Clay			
9.5	Sand	WS-1	11-12	1000
12	Clay			
16.3	Sand	WS-2	16.3-17.3	1000
17.3	Clay			
25.4	Sand	WS-3	25.4-26.4	1000

* Sample taken from auger.

PENETROMETER LOG

HYDROPUNCH HOLE NO: DH-34

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: June 11, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4220.75
HOLE DIAMETER: 7.25 inches
LOGGED BY: P.C.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Top soil			
1	Clay	WS-1	5*	1000
5	Clay			
8	Silty sand			
9.1	Sand	WS-2	9.1-10.1	10
10.1	Clay			
16	Sand	WS-3	17-18	1000

HYDROPUNCH HOLE NO: DH-35

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: June 12, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4237.82
HOLE DIAMETER: 7.25 inches
LOGGED BY: P.C.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Fill, gravel, sand			
5	Clay			
6	Clay			
8	Clay			
11.7	Sand	WS-1	11.7-12.7	1000
12.7	Silty sand			
16.5	Sand	WS-2	16.5-17.5	1000

Sample taken from auger.

PENETROMETER LOG

HYDROPUNCH HOLE NO: DH-36

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: June 12, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4240.20
HOLE DIAMETER: 7.25 inches
LOGGED BY: P.C.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Fill, gravel, sand			
5	Clay			
8	Sand	WS-1	8*	500
8.5	Clay			
10	Sand	WS-2	11.6-12.6	1000
12.6	Sand	WS-3	17.8-18.8	1000

HYDROPUNCH HOLE NO: DH-37

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: June 13, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4239.11
HOLE DIAMETER: 7.25 inches
LOGGED BY: P.C.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Fill, gravel, sand			
5	Clay			
8	Clay	WS-1	10*	500
13	Sand	WS-2	13.7-14.7	1000
14.7	Sand	WS-3	17.7-18.7	1000

* Sample taken from auger.

PENETROMETER LOG

HYDROPUNCH HOLE NO: DH-38

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: June 13,1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4233.45
HOLE DIAMETER: 7.25 inches
LOGGED BY: P.C.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Fill, gravel, sand			
5	Clay	WS-1	5*	1000
9.5	Sand	WS-2	9.5-10.5	1000
10.5	Clay			
13	Sand	WS-3	13-14	1000

HYDROPUNCH HOLE NO: DH-46

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: July 11, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4229.26
HOLE DIAMETER: 7.25 inches
LOGGED BY: P.C.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Road base			
2	Fill, gravel, sand			
5	Clayey sand			
10	Clayey sand	WS-1	9*	1000
12.5	Sand	WS-2	12.5-13.5	1000

* Sample taken from auger.

PENETROMETER LOG

HYDROPUNCH HOLE NO: DH-47

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: July 11, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4228.81
HOLE DIAMETER: 7.25 inches
LOGGED BY: D.H.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Road Base			
2	Fill, gravel, sand			
5	Clayey sand	WS-1	9*	1000
12	Sand	WS-2	13.5-14.5	1000
15	Clay			
18	Sand	WS-3	18-19	1000

HYDROPUNCH HOLE NO: DH-48

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: July 11,1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4226.94
HOLE DIAMETER: 7.25 inches
LOGGED BY: D.H.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Road base			
2	Fill, gravel, sand			
5	Clayey sand	WS-1	9*	1000
12	Sand	WS-2	12.5-13.5	1000
17	Sand	WS-3	17.3-18.3	1000

* Sample taken from auger.

PENETROMETER LOG

HYDROPUNCH HOLE NO: DH-49

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: November 15, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4223.8
HOLE DIAMETER: 7.25 inches
LOGGED BY: D.H.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Silty sandy clay			
4	Clay	WS-1	4*	1000
9.5	Sand	WS-2	9.5-10.5	1000
11	Clay			
20	Clay			
27	Sand	WS-3	27-28	1000

HYDROPUNCH HOLE NO: DH-50

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: November 14, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4228.0
HOLE DIAMETER: 7.25 inches
LOGGED BY: D.H.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Silty sand clay			
4	Clay, with occasional sandy clay lenses	WS-1	4*	1000
10	Clay	WS-2	8.5-9.5	100
18	Clay	WS-3	18-19	100
24.5	Sand			
26.5	Sand clay lenses	WS-4	27-28	1000
31	Sand	WS-5	30.4-31.4	800

* Sample taken from auger.

PENETROMETER LOG

HYDROPUNCH HOLE NO: DH-51

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: November 15, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4225.2
HOLE DIAMETER: 7.25 inches
LOGGED BY: D.H.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Silty sandy clay			
4	Clay, with occasional sandy clay lense	WS-1	4*	1000
10	Clay		7-8	0
14	Sandy clay	WS-2	14-15	100
16.5	Clay			
26.8	Sand	WS-3	26.8-27.8	1000
32.6	Sand	WS-4	32.6-33.6	1000

PENETROMETER LOG

HYDROPUNCH HOLE NO: OS-1

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: June 10, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: 4221.7
HOLE DIAMETER: 7.25 inches
LOGGED BY: P.C.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Top soil			
1	Clayey layers			
5	Clay	WS-1	5*	1000
12	possible sand layers	WS-2	12-13	1000
15	Clayey layers	WS-3	15	1000
25	Possible silty sand layers		23-24	0
29	Clay		29-30	0
30	Sand	WS-4	32-33	1000

HYDROPUNCH HOLE NO: OS-2

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: June 27, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: NA
HOLE DIAMETER: 7.25 inches
LOGGED BY: G.L.M.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Clay			
2	Sand			
3.5	Clay			
8	Sand	OS-2	8-9	1000
9	Clay			

* Sample taken from auger.

PENETROMETER LOG

HYDROPUNCH HOLE NO: OS-3

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: June 28, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: NA
HOLE DIAMETER: 7.25 inches
LOGGED BY: G.L.M.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Silt			
1.5	Clay			
5	Clay			
8	Clay			
9	Sand	OS-3	9-10	1000

HYDROPUNCH HOLE NO: OS-4

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: June 28, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: NA
HOLE DIAMETER: 7.25 inches
LOGGED BY: G.L.M.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Silt			
1.5	Clay			
5	Clay			
8	Clay			
8.5	Silt			
12	Sand	OS-4	12.5-13.5	1000

PENETROMETER LOG

HYDROPUNCH HOLE NO: OS-5

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: July 1, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: NA
HOLE DIAMETER: 7.25 inches
LOGGED BY: G.L.M.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Silt			
1.2	Sand			
1.8	Clay			
5	Clay			
8	Clay with sand lenses	OS-5	8-9	1000

HYDROPUNCH HOLE NO: OS-6

PROJECT: RCRA Facility Investigation
PROJECT NO: 1104-007
DRILLER: Bedke
DATE: July 1, 1991
DRILL RIG: Acker
GROUND SURFACE ELEVATION: NA
HOLE DIAMETER: 7.25 inches
LOGGED BY: G.L.M.

DEPTH	INTERPRETED SOIL DESCRIPTION	GROUNDWATER SAMPLE		
		SAMPLE I.D.	DEPTH (ft)	RECOVERY (ml)
0	Clayey silt			
1.5	Sand			
2	Clay			
4	Sand lense			
7	Sand lense	OS-6	7-8	1000
10	Sand lense			
15	Sand lense			

GROUNDWATER FIELD INDICATOR RESULTS

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID: DH-1 Sampling/Analysis Date: 5-22-91

Groundwater Sample Number	WS-1	WS-2	WS-3
Sample Depth (ft)**	8*	22.5-23.5	36-37
PARAMETER			
pH	6.5	6.7	7.06
Temperature (°C)	11.6	18.3	15.7
Specific Conductivity (umhos/cm)	3168	***	555
Sulfate (mg/l)	1600	1413	60

* Sample collected from auger.
** Groundwater sampling attempted at the following depths with no or insufficient recovery: 13.0'
***Insufficient sample recovery to conduct S.C. reading.

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID: DH-2 Sampling/Analysis Date: 5-22-91

Groundwater Sample Number	WS-1	WS-2	WS-3	WS-4	WS-5
Sample Depth (ft)	8-9	13-14	23-24	26.5-27.5	33-34
PARAMETER					
pH	4.81	5.28	5.27	5.18	7.10
Temperature (°C)	15.3	16.3	18.6	17.2	14.5
Specific Conductivity (umhos/cm)	3191	5971	6183	8428	524
Sulfate (mg/l)	3233	7427	7261	13710	37

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID: DH-3 Sampling/Analysis Date: 5-23-91

Groundwater Sample Number	WS-1	WS-2	WS-3	WS-4	WS-5
Sample Depth (ft)	7	12-13	18-19	23-24	30.5-31.5
PARAMETER					
pH	4.45	4.40	5.15	5.02	6.89
Temperature (°C)	13.3	14.7	15.5	15.0	15.4
Specific Conductivity (umhos/cm)	4024	4712	5874	10600	475
Sulfate (mg/l)	4672	5147	6572	15490	36

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-4 Sampling/Analysis Date: 5-2-91

Groundwater Sample Number	WS-1	WS-2	WS-3	WS-4	WS-5
Sample Depth (ft)**	4.3	14-15	18.5-19.5	25-26	30.5-31.5
PARAMETER					
pH	4.64	6.13	6.21	6.43	6.91
Temperature (°C)	19.5	13.2	13.3	12.0	12.5
Specific Conductivity (umhos/cm)	3247	5108	4725	5367	497
Sulfate (mg/l)	3010	3539	3274	3660	27

** Groundwater sampling attempted at the following depths with no or insufficient recovery: 11.5'

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-6 Sampling/Analysis Date: 5-14-91

Groundwater Sample Number	WS-1	WS-2	WS-3	WS-4
Sample Depth (ft)**	5.5	8.5	16.2-17.2	27.3-28.3
PARAMETER				
pH	5.4	5.7	5.8	6.2
Temperature (°C)	12.5	10	11	12
Specific Conductivity (umhos/cm)	2618	2613	1251	510
Sulfate (mg/l)	1759	1259	316	32

** Groundwater sampling attempted at the following depths with no or insufficient recovery: 13'

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-7 Sampling/Analysis Date: 5-30-91

Groundwater Sample Number	WS-1	WS-2	WS-3	WS-4
Sample Depth (ft)**	5*	7-8	15*	34.1-35.1
PARAMETER				
pH	6.33	6.22	6.31	6.75
Temperature (°C)	12.2	13.7	14.8	14.4
Specific Conductivity (umhos/cm)	1314	2299	4628	505
Sulfate (mg/l)		915	3778	3.6

* Sample collected from auger.

** Groundwater sampling attempted at the following depths with no or insufficient recovery: 13'

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-8 Sampling/Analysis Date: 5-24-91

Groundwater Sample Number	WS-1	WS-2	WS-3	WS-4
Sample Depth (ft)	7	13.5-14.5	18-19	21-22
PARAMETER				
pH	6.73	6.59	7.23	7.11
Temperature (°C)	16.0	16.3	16.2	16.8
Specific Conductivity (umhos/cm)	1686	1583	1307.9	1486
Sulfate (mg/l)	188	188	102	91

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-9 Sampling/ Analysis Date: 5-30-91

Groundwater Sample Number	WS-1	WS-2	WS-3	WS-4	WS-5	WS-6
Sample Depth (ft)	5*	9.5	13.3	17.8	23-24	32-33
PARAMETER						
pH	6.61	6.49	5.84	6.42	6.81	7.18
Temperature (°C)	12.5	11.5	12	11.6	11.9	12.6
Specific Conductivity umhos/cm)	2422	1891	1743	2159	2554	497
Sulfate (mg/l)	989	711	759	916	1643	7

* Sample collected from auger.

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-10 Sampling/Analysis Date: 6-5-91

Groundwater Sample Number	WS-1	WS-2	WS-3
Sample Depth (ft)**	5*	9.8 - 10.8	15*
PARAMETER			
pH	6.3	6.4	6.5
Temperature (°C)	17	13.5	15
Specific Conductivity (umhos/cm)	1998	1496	1644
Sulfate (mg/l)	298	155	220

* Sample collected from auger.

** Groundwater sampling attempted at the following depths with no or insufficient recovery: 15.8', 21.9'

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-11 Sampling/Analysis Date: 5-3-91

Groundwater Sample Number	WS-1	WS-2	WS-3	WS-4	WS-5
Sample Depth (ft)**	5.5	10.5-11.5	14-15	18.3-19.3	33-34
PARAMETER					
pH	5.9	5.7	5.8	6.0	7.0
Temperature (°C)	13.5	11	13	11	13.6
Specific Conductivity (umhos/cm)	2490	1485	1676	2172	463
Sulfate (mg/l)	1122	206	530	963	0.24

** Groundwater sampling attempted at the following depths with no or insufficient recovery: 27'

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-12 Sampling/Analysis Date: 5-3-91

Groundwater Sample Number	WS-1	WS-2	WS-3	WS-4	WS-5
Sample Depth (ft)**	5.5	12-13	17.5-18.5	20-21	30-31
PARAMETER					
pH	5.14	5.95	6.01	6.18	7.00
Temperature (°C)	7.4	8.9	10.1	9.5	10.3
Specific Conductivity (umhos/cm)	2217	6067	6994	8184	550
Sulfate (mg/l)	1272	4082	7468	7027	70

** Groundwater sampling attempted at the following depths with no or insufficient recovery: 27'

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-13 Sampling/Analysis Date: 4-30-91

Groundwater Sample Number	WS-1	WS-2	WS-3	WS-4
Sample Depth (ft)**	3.5	12-13	17-18	27.5-28.5
PARAMETER				
pH	6.39	6.30	6.62	7.03
Temperature (°C)	12.7	16.3	17.6	16.1
Specific Conductivity (umhos/cm)	2426	3351	***	532
Sulfate (mg/l)	1351	1302	1314	27

** Groundwater sampling attempted at the following depths with no or insufficient recovery: 4.5', 5.0', 5.5', 6.0'

***Insufficient sample recovery to conduct S.C. reading.

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-14 Sampling/Analysis Date: 4-30-91

Groundwater Sample Number	WS-1	WS-2	WS-3	WS-4
Sample Depth (ft)**	6	9	15	19-20
PARAMETER				
pH	6.04	5.55	5.98	6.31
Temperature (°C)	14.4	11.0	13.0	17.8
Specific Conductivity (umhos/cm)	3018	3025	*	*
Sulfate (mg/l)	1966	2179	1643	1037

* Insufficient sample recovery to conduct S.C. reading.
** Groundwater sampling attempted at the following depths with no or insufficient recovery: 5.0', 5.5', 10.5', 11.0', 11.5', 15.5', 16.0', 17.0', 18.0'

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-15 Sampling/Analysis Date: 4-24-91

Groundwater Sample Number	WS-1	WS-2
Sample Depth (ft.)	5	11.5
PARAMETER		
pH	5.93	6.67
Temperature (°C)	16	13.6
Specific Conductivity (umhos/cm)	1340	1347
Sulfate (mg/l)	618	680

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-16 Sampling/Analysis Date: 4-24-91

Groundwater Sample Number	WS-1	WS-2	WS-3	WS-4
Sample Depth (ft)**	2.5*	10.5	16	20
PARAMETER				
pH	7.2	6.82	6.88	7.05
Temperature (°C)	16.5	15	12.9	14.4
Specific Conductivity (umhos/cm)	1022	853	942	499
Sulfate (Mg/l)	72	8	68	7

* Sample collected from auger.
** Groundwater Sampling attempted at the following depths with no or insufficient recovery: 5.5', 7.5'

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-17 Sampling/Analysis Date: 6-6-91

Groundwater Sample Number	WS-1	WS-2	WS-3	WS-4	WS-5	WS-6
Sample Depth (ft)	5*	8-9	15.3-16.3	15	22-23	28-29
PARAMETER						
pH	6.71	6.79	***	7.03	***	7.88
Temperature (°C)	15.0	14.0	***	20.0	***	20.7
Specific Conductivity (umhos/cm)	2082	1641	***	1279	***	***
Sulfate (mg/l)	423	361	205	198	142	0.1

* Sample taken from auger.
***Insufficient sample recovery to conduct pH and S.C. reading

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-18 Sampling/Analysis Date: 5-6-91

Groundwater Sample Number	WS-1	WS-2	WS-3
Sample Depth (ft)**	5*	10.5-11.5	30.5-31.5
PARAMETER			
pH	6.4	6.3	6.9
Temperature (°C)	11.0	11.3	14.0
Specific Conductivity (umhos/cm)	1950	1810	474
Sulfate (mg/l)	783.6	459.5	0.4

* Sample collected from auger.
** Groundwater sampling attempted at the following depths with no or insufficient recovery: 13.5', 18.5'

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-19 Sampling/Analysis Date: 5-6-91

Groundwater Sample Number	WS-1	WS-2	WS-3	WS-4	WS-5
Sample Depth (ft)**	5*	11-12	16-17	19-20	29.3-30.3
PARAMETER					
pH	3.2	5.7	5.6	5.7	6.4
Temperature (°C)	10.1	15.9	15	15.4	16
Specific Conductivity (umhos/cm)	4425	7662	8105	8729	464
Sulfate (mg/l)	3271	5178	6406	6628	13

* Sample collected from auger.
** Groundwater sampling attempted at the following depths with no or insufficient recovery: 3.5', 25.7'

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID: DH-20 Sampling/Analysis Date: 5-15-91

Groundwater Sample Number	WS-1	WS-2	WS-3
Sample Depth (ft)**	5*	8-9	26.5-27.5
PARAMETER			
pH	5.6	5.8	6.4
Temperature (°C)	12	11	13
Specific Conductivity (umhos/cm)	2475	2406	1112
Sulfate (mg/l)	1738	1597	318

* Sample collected from auger.
** Groundwater sampling attempted at the following depths with no or insufficient recovery: 3.0', 15.5'

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID: DH-21 Sampling/Analysis Date: 5-15-91

Groundwater Sample Number	WS-1	WS-2
Sample Depth (ft)	5*	18-19
PARAMETER		
pH	5.7	6.5
Temperature (°C)	12.0	12.5
Specific Conductivity (umhos/cm)	1328	458
Sulfate (mg/l)	567	5

* Sample collected from inside of auger.
** Groundwater sampling attempted at the following depths with no or insufficient recovery: 4.5', 5.5', 6.5', 7.7'

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID: DH-22 Sampling/Analysis Date: 5-15-91

Groundwater Sample Number	WS-1	WS-2
Sample Depth (ft)	5.5	9.2-10.2
PARAMETER		
pH	6.3	6.2
Temperature (°C)	16	13
Specific Conductivity (umhos/cm)	877	958
Sulfate (mg/l)	50	37

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID: DH-23 Sampling/Analysis Date: 5-16-91

Groundwater Sample Number	WS-1	WS-2
Sample Depth (ft)**	4*	8.7-9.7
PARAMETER		
pH	6.35	6.4
Temperature (°C)	13	15
Specific Conductivity (umhos/cm)	1121	1072
Sulfate (mg/l)	123	181

* Sample collected from inside of auger.
** Groundwater sampling attempted at the following depths with no or insufficient recovery: 5.0'

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-24 Sampling/Analysis Date: 5-16-91

Groundwater Sample Number	WS-1	WS-2	WS-3	WS-4
Sample Depth (ft)**	5.5	9-10	16.1-17.1	26-27
PARAMETER				
pH	6.2	6.2	6.3	6.5
Temperature (°C)	16	12	18	14
Specific Conductivity (umhos/cm)	1950	1251	*	548
Sulfate (mg/l)	741	205	466	39

* Insufficient sample recovery to conduct S.C. reading.
** Groundwater sampling attempted at the following depths with no or insufficient recovery: 4.0'

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-25 Sampling/Analysis Date: 5-17-91

Groundwater Sample Number	WS-1	WS-2	WS-3	WS-4	WS-5
Sample Depth (ft)**	7.4	11.5-12.5	17-18	23-24	26.5-27.5
PARAMETER					
pH	6.78	6.48	6.36	6.96	7.63
Temperature (°C)	23.0	10.9	11.5	12.2	11.7
Specific Conductivity (umhos/cm)	1133	1296	1244	1247	571
Sulfate (mg/l)	151	309	2	275	14

** Groundwater sampling attempted at the following depths with no or insufficient recovery: 4.5', 26.5'

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-26 Sampling/Analysis Date: 5-17-91

Groundwater Sample Number	WS-1	WS-2
Sample Depth (ft)	5*	7.3-8.3
PARAMETER		
pH	7.07	6.92
Temperature (°C)	10.3	6.2
Specific Conductivity (umhos/cm)	805	888
Sulfate (mg/l)	4	33

* Sample collected from inside of auger.

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-27 Sampling/Analysis Date: 5-21-91

Groundwater Sample Number	WS-1	WS-2	WS-3	WS-4
Sample Depth (ft)	5*	9-10	16.7-17.7	27-28
PARAMETER				
pH	6.81	6.81	7.49	7.66
Temperature (°C)	13.4	12.0	18.0	14.7
Specific Conductivity (umhos/cm)	2694	1636	***	499
Sulfate (mg/l)	984	796	467	7

* Sample collected from auger.
***Insufficient sample recovery to conduct S.C. reading.

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-28 Sampling/Analysis Date: 5-21-91

Groundwater Sample Number	WS-1	WS-2	WS-3	WS-4
Sample Depth (ft)	5*	8-9	16-17	26.5-27.5
PARAMETER				
pH	6.80	6.68	7.24	7.35
Temperature (°C)	16.0	14.2	20.0	14.5
Specific Conductivity (umhos/cm)	2314	2873	***	609
Sulfate (mg/l)	867	1464	405	24

* Sample collected from auger.
***Insufficient sample recovery to conduct S.C. reading.

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-29 Sampling/Analysis Date: 5-31-91

Groundwater Sample Number	WS-1	WS-2
Sample Depth (ft)	5*	10.5-11.5
PARAMETER		
pH	6.92	6.42
Temperature (°C)	11	12.4
Specific Conductivity (umhos/cm)	1582	1571
Sulfate (mg/l)	204	35

* Sample collected from auger.

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-30 Sampling/Analysis Date 5-31-91

Groundwater Sample Number	WS-1	WS-2	WS-3	WS-4
Sample Depth (ft)**	5*	10.1	10*	30.1-31.1
PARAMETER				
pH	7.03	6.96	7.22	7.49
Temperature (°C)	13.4	12.1	15	15
Specific Conductivity (umhos/cm)	1690	1681	1557	416
Sulfate (mg/l)	274	302	255	2

* Sample collected from auger.
** Groundwater sampling attempted at the following depths with no or insufficient recovery: 16.7'

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-31 Sampling/Analysis Date: 6-6-91

Groundwater Sample Number	WS-1	WS-2	WS-3	WS-4	WS-5
Sample Depth (ft)	5*	10 - 11	13 - 14	19.6 - 20.6	28 - 29
PARAMETER					
pH	6.11	6.48	6.43	6.75	7.17
Temperature (°C)	15.6	17	15.1	14.3	14.5
Specific Conductivity (umhos/cm)	3270	3091	3180	2524	461
Sulfate (mg/l)	2084	1026	1760	1057	15

* Sample collected from auger.

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-32 Sampling/Analysis Date: 6-7-91

Groundwater Sample Number	WS-1	WS-2	WS-3	WS-4	WS-5
Sample Depth (ft)	5*	7.5-8.5	10	17-18	30-31
PARAMETER					
pH	6.84	***	6.91	7.28	7.25
Temperature (°C)	17.3	***	21.0	20.0	16.1
Specific Conductivity (umhos/cm)	1486	***	1208	***	558
Sulfate (mg/l)	384	193	292	1	46

* Sample collected from auger.
***Insufficient sample recovery to conduct pH & S.C. reading

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-33 Sampling/Analysis Date: 6-10-91

Groundwater Sample Number	WS-1	WS-2	WS-3
Sample Depth (ft)**	11 - 12	16.3 - 17.3	25.4 - 26.4
PARAMETER			
pH	6.84	6.88	7.41
Temperature (°C)	15	14.6	13.9
Specific Conductivity (umhos/cm)	1760	1815	487
Sulfate (mg/l)	476	754	53

** Groundwater sampling attempted at the following depths with no or insufficient recovery: 5'

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-34 Sampling/Analysis Date: 6-11-91

Groundwater Sample Number	WS-1	WS-2	WS-3
Sample Depth (ft)	5*	9.1 - 10.1	17 - 18
PARAMETER			
pH	6.75	7.07	7.04
Temperature (°C)	17.7	21.1	16.5
Specific Conductivity (umhos/cm)	1908	***	1396
Sulfate (mg/l)	339	354	178

* Sample collected from auger
***Insufficient sample recovery to conduct pH & S.C. reading

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-35 Sampling/Analysis Date: 6-12-91

Groundwater Sample Number	WS-1	WS-2
Sample Depth (ft)**	11.7 - 12.7	16.5 - 17.5
PARAMETER		
pH	6.95	6.88
Temperature (°C)	17.4	16.1
Specific Conductivity (umhos/cm)	1590	1500
Sulfate (mg/l)	99	82

** Groundwater sampling attempted at the following depths with no or insufficient recovery: 5', 6', 8', 10'

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-36 Sampling/Analysis Date: 6-12-91

Groundwater Sample Number	WS-1	WS-2	WS-3
Sample Depth (ft)**	8*	11.6 - 12.6	17.8 - 18.8
PARAMETER			
pH	6.83	6.88	7.06
Temperature (°C)	21.7	20.1	19.5
Specific Conductivity (umhos/cm)	1654	1490	1304
Sulfate (mg/l)	233	84	49

* Sample collected from auger.
** Groundwater sampling attempted at the following depths with no or insufficient recovery: 5'

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-37 Sampling/Analysis Date: 6-13-91

Groundwater Sample Number	WS-1	WS-2	WS-3
Sample Depth (ft)**	10*	13.7 - 14.7	17.7 - 18.7
PARAMETER			
pH	6.24	5.31	6.90
Temperature (°C)	20.2	17.2	16.7
Specific Conductivity (umhos/cm)	3152	4419	1491
Sulfate (mg/l)	1964	4301	87

* Sample collected from Auger.
** Groundwater sampling attempted at the following depths with no or insufficient recovery: 5', 8'

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-38 Sampling/Analysis Date: 6-13-91

Groundwater Sample Number	WS-1	WS-2	WS-3
Sample Depth (ft)	5*	9.5 - 10.5	13 - 14
PARAMETER			
pH	6.80	6.96	6.97
Temperature (°C)	22.3	17.5	15
Specific Conductivity (umhos/cm)	1492	1386	1308
Sulfate (mg/l)	402	221	138

* Sample collected from auger.

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-39 Sampling/Analysis Date: 6-14-91

Groundwater Sample Number	WS-1	WS-2
Sample Depth (ft)	22.6 - 23.6	24 - 25
PARAMETER		
pH	5.68	5.73
Temperature (°C)	15.2	15.7
Specific Conductivity (umhos/cm)	8232	8404
Sulfate (mg/l)	8519	8222

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-40 Sampling/Analysis Date: 6-14-91

Groundwater Sample Number	WS-1
Sample Depth (ft)	23 - 24
PARAMETER	
pH	5.77
Temperature (°C)	14.3
Specific Conductivity (umhos/cm)	6859
Sulfate (mg/l)	7700

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-41 Sampling/Analysis Date: 6-17-91

Groundwater Sample Number	WS-1	WS-2	WS-3
Sample Depth (ft)	5*	17-18	26-27
PARAMETER			
pH	5.35	6.07	6.55
Temperature (°C)	18.8	23.3	20.0
Specific Conductivity (umhos/cm)	3522	***	***
Sulfate (mg/l)	3461	3435	2428

* Sample may have been collected from auger

***Insufficient sample recovery to conduct pH & S.C. reading

SYRO STEEL RCRA FACILITY

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-42 Sampling/Analysis Date: 6-19-91

Groundwater Sample Number	WS-1
Sample Depth (ft)	26-27
PARAMETER	
pH	6.51
Temperature (°C)	22.9
Specific Conductivity (umhos/cm)	***
Sulfate (mg/l)	3405

***Insufficient sample recovery to conduct S.C. reading

SYRO STEEL RCRA FACILITY

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-45 Sampling/Analysis Date: 6-19-91

Groundwater Sample Number	WS-1	WS-2
Sample Depth (ft)	8 - 10	28.5-29.5
PARAMETER		
pH	6.23	7.06
Temperature (°C)	14.0	14.9
Specific Conductivity (umhos/cm)	3997	511
Sulfate (mg/l)	2808	19

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-46 Sampling/Analysis Date: 7-11-91

Groundwater Sample Number	WS-1	WS-2
Sample Depth (ft)	9	12.5-13.5
PARAMETER		
pH	7.16	7.20
Temperature (°C)	27.8	22.0
Specific Conductivity (umhos/cm)	1100	1038
Sulfate (mg/l)	76	131

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-47 Sampling/Analysis Date: 7-11-91

Groundwater Sample Number	WS-1	WS-2	WS-3
Sample Depth (ft)	9*	13.5-14.5	18.0-19.0
PARAMETER			
pH	7.18	7.20	7.21
Temperature (°C)	25.4	24.1	21.0
Specific Conductivity (umhos/cm)	1425	1297	1063
Sulfate (mg/l)	79	78	231

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-48 Sampling/Analysis Date: 7-11-91

Groundwater Sample Number	WS-1	WS-2	WS-3
Sample Depth (ft)	9	12.5-13.5	17.3-18.3
PARAMETER			
pH	7.09	7.40	7.41
Temperature (°C)	23.5	21.3	21.8
Specific Conductivity (umhos/cm)	1235	1076	1069
Sulfate (mg/l)	90	113	113

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-49 Sampling/Analysis Date: 11-15-91

Groundwater Sample Number	WS-1	WS-2	WS-3
Sample Depth (ft)	4*	9.5-10.5	27-28
PARAMETER			
pH	6.64	6.74	7.54
Temperature (°C)	10.6	11.3	13.5
Specific Conductivity (umhos/cm)	1743	1494	575
Sulfate (mg/l)	609	413	24

* Sample collected from auger.

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-50 Sampling/Analysis Date: 11-14-91

Groundwater Sample Number	WS-1	WS-2	WS-3	WS-4	WS-5
Sample Depth (ft)	4*	8.5-9.5	18-19	26-27	30.4-31.4
PARAMETER					
pH	5.81	6.40	5.93	7.07	7.05
Temperature (°C)	12.8	13.0	12.6	11.7	11.5
Specific Conductivity (umhos/cm)	2937	***	***	536	503
Sulfate (mg/l)	2398	1117	1105	7	58

* Sample collected from auger.
***Insufficient sample recovery to conduct S.C. reading

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Drill Hole ID # DH-51 Sampling/Analysis Date: 11-15-91

Groundwater Sample Number	WS-1	WS-2	WS-3	WS-4
Sample Depth (ft)	4*	14-15	26.8-27.8	32.6-33.6
PARAMETER				
pH	6.39	6.94	7.07	7.57
Temperature (°C)	9.8	13	11.6	11.4
Specific Conductivity (umhos/cm)	1741	***	509	883
Sulfate (mg/l)	521	598	2	159

* Sample collected from auger.
***Insufficient sample recovery to conduct S.C. reading

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results For Groundwater Samples

Off-Site Drill Holes

Sample Number	OS-1	OS-2	OS-3	OS-4	OS-5	OS-6
Sample Depth (ft)	5	8-9	9-10	12.5-13.5	7-8	7-8
Sampling Date	6-10-91	6-27-91	6-28-91	6-28-91	7-1-91	7-1-91
PARAMETER						
pH	6.72	6.94	7.21	7.44	7.56	6.91
Temperature (°C)	17.5	16.3	17.4	15.7	17.4	17.1
Specific Conductivity (umhos/cm)	941	2497	1125	795	1965	1489
Sulfate (mg/l)	83	904	71	21	179	274

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Well ID #	MH-2	MH-3	S.W.*
Date	6-13-91	6-25-91	6-25-91
PARAMETER			
pH	6.19	6.80	6.90
Temperature (°C)	15.3	15.8	19.5
S. Conductivity	2680	1605	4059
Sulfate (mg/l)	1704	110	1633

* Syro Well

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Well ID #	DG-1	DG-2	DG-3	DG-4	DG-5	DG-6
Date	6-13-91	6-24-91	5-14-91	6-14-91	6-14-91	6-17-91
PARAMETER						
pH	7.42	6.46	5.58	5.50	5.44	5.36
Temperature (°C)	15.5	13.9	13.6	11	13.3	18.5
S. Conductivity	535	3745	4240	4058	4507	3805
Sulfate (mg/l)	32	2523	3681	3408	3811	3806

SYRO STEEL RCRA FACILITY INVESTIGATION

Field Indicator Results for Groundwater Samples

Well ID #	P-1	P-2	P-3	P-4	P-5	P-6	P-7	P-9
Date	6-24-91	6-24-91	6-24-91	6-24-91	6-24-91	6-24-91	7-12-91	6-24-91
PARAMETER								
pH	6.80	5.72	5.97	6.47	6.94	6.70	7.19	6.87
Temperature (°C)	13	18.7	13.7	15.3	14.7	16.3	30.0	16.4
S. Conductivity	1827	3329	9512	4336	1665	1340	2280	2097
Sulfate (mg/l)	597	2891	12530	2814	622	724	2262	568

SLUG TEST RESULTS

SYRO STEEL COMPANY
SUMMARY OF SLUG INJECTION TESTS

Well I.D.	Screen Length (feet)	Effective Aquifer Length (feet)*	Volume of Water Injected (gallons)	Calculated Ho (feet)	Hydraulic Conductivity (cm/sec)	Analysis Method
MW-1	9.4	9.4	1.0	2.7	2.3E-04	4
MW-2	9.4	9.4	1.2	2.8	1.8E-04	4
MW-3	9.4	9.4	1.2	2.5	1.7E-04	4
MW-4	9.4	9.4	1.4	2.2	7.2E-05	4
MW-5	9.4	9.4	1.0	1.0	5.2E-05	4
MW-6	13.7	13.7	2.0	2.1	3.5E-04	4
DH-41	13.7	13.7	1.2	3.9	1.2E-04	4
DH-42	9.4	9.4	1.0	3.7	6.6E-05	4
DH-43	9.4	5.6	1.1	4.6	1.3E-04	4
DH-45	9.4	4.5	1.3	4.9	2.9E-04	4
SYRO Well	9.4	9.4	1.5	2.0	1.3E-04	4
UG-Well	10.0	7.0	1.4	0.9	1.2E-04	4
DG-4	15.0	12.0	0.3	2.2	2.9E-04	4

* w/ revised numbers

MLB 4/22/92

Analysis Methods:

1. Hvorslev Method
2. Cooper-Bredehoeft-Papadopulos Method
3. Ferris-Knowles Method
4. Bouwer Method

WELL # MW-1

WELL DIAMETER= 7.75 INCHES
CASING DIAMETER= 2.00 INCHES
VOLUME OF WATER REMOVED OR ADDED TO WELL= .42 GALLONS
LENGTH OF AQUIFER TESTED= 9.40 FEET
VALUE OF HO= 2.66 FEET
STATIC WATER LEVEL= 3.44 FEET

SLUG TEST DATA:

TIME SINCE TEST BEGAN (MINUTES)	WATER LEVEL (FEET)	DRAWDOWN (FEET)	HEAD RATIO	RECIPROCAL TIME (1/MINUTES)
.17	6.00	2.56	.962	6.001
.33	5.68	2.24	.842	3.000
.50	5.48	2.04	.767	2.000
.67	5.31	1.87	.703	1.500
.83	5.16	1.72	.647	1.200
1.00	5.03	1.59	.598	1.000
1.17	4.91	1.47	.553	.857
1.33	4.80	1.36	.511	.750
1.50	4.70	1.26	.474	.667
1.67	4.60	1.16	.436	.600
1.83	4.52	1.08	.406	.545
2.00	4.44	1.00	.376	.500
2.17	4.37	.93	.350	.462
2.33	4.30	.86	.323	.429
2.50	4.24	.80	.301	.400
2.67	4.18	.74	.278	.375
2.83	4.13	.69	.259	.353
3.00	4.08	.64	.241	.333
3.17	4.04	.60	.226	.316
3.33	3.99	.55	.207	.300
3.50	3.96	.52	.195	.286
3.67	3.92	.48	.180	.273
3.83	3.89	.45	.169	.261
4.00	3.85	.41	.154	.250
4.17	3.83	.39	.147	.240
4.33	3.80	.36	.135	.231
4.50	3.78	.34	.128	.222
4.67	3.76	.32	.120	.214
4.83	3.74	.30	.113	.207
5.00	3.72	.28	.105	.200
5.17	3.71	.27	.102	.194
5.33	3.69	.25	.094	.188
5.50	3.67	.23	.086	.182
5.67	3.65	.21	.079	.176
5.83	3.64	.20	.075	.171
6.00	3.63	.19	.071	.167
6.17	3.61	.17	.064	.162
6.33	3.60	.16	.060	.158
6.50	3.58	.14	.053	.154
6.67	3.58	.14	.053	.150
6.83	3.57	.13	.049	.146
7.00	3.57	.13	.049	.143

WELL # MW-2

WELL DIAMETER= 7.75 INCHES
CASING DIAMETER= 2.00 INCHES
VOLUME OF WATER REMOVED OR ADDED TO WELL= .40 GALLONS
LENGTH OF AQUIFER TESTED= 9.40 FEET
VALUE OF H0= 2.81 FEET
STATIC WATER LEVEL= 4.81 FEET

SLUG TEST DATA:

TIME SINCE TEST BEGAN (MINUTES)	WATER LEVEL (FEET)	DRAWDOWN (FEET)	HEAD RATIO	RECIPROCAL TIME (1/MINUTES)
.17	7.27	2.46	.875	6.001
.33	6.97	2.16	.769	3.000
.50	6.69	1.88	.669	2.000
.67	6.46	1.65	.587	1.500
.83	6.26	1.45	.516	1.200
1.00	6.10	1.29	.459	1.000
1.17	5.96	1.15	.409	.857
1.33	5.84	1.03	.367	.750
1.50	5.74	.93	.331	.667
1.67	5.64	.83	.295	.600
1.83	5.56	.75	.267	.545
2.00	5.49	.68	.242	.500
2.17	5.43	.62	.221	.462
2.33	5.38	.57	.203	.429
2.50	5.33	.52	.185	.400
2.67	5.28	.47	.167	.375
2.83	5.24	.43	.153	.353
3.00	5.21	.40	.142	.333
3.17	5.18	.37	.132	.316
3.33	5.15	.34	.121	.300
3.50	5.12	.31	.110	.286
3.67	5.10	.29	.103	.273
3.83	5.08	.27	.096	.261
4.00	5.06	.25	.089	.250
4.17	5.04	.23	.082	.240
4.33	5.03	.22	.078	.231
4.50	5.02	.21	.075	.222
4.67	5.00	.19	.068	.214
4.83	5.00	.19	.068	.207
5.00	4.98	.17	.060	.200
5.17	4.97	.16	.057	.194
5.33	4.97	.16	.057	.188
5.50	4.96	.15	.053	.182
5.67	4.95	.14	.050	.176
5.83	4.94	.13	.046	.171
6.00	4.94	.13	.046	.167
6.17	4.94	.13	.046	.162
6.33	4.93	.12	.043	.158
6.50	4.92	.11	.039	.154
6.67	4.92	.11	.039	.150
6.83	4.91	.10	.036	.146
7.00	4.91	.10	.036	.143

7.17	4.91	.10	.036	.140
7.33	4.91	.10	.036	.136
7.50	4.90	.09	.032	.133
7.67	4.91	.10	.036	.130
7.83	4.90	.09	.032	.128
8.00	4.90	.09	.032	.125
8.17	4.90	.09	.032	.122
8.33	4.90	.09	.032	.120
8.50	4.89	.08	.028	.118
8.67	4.89	.08	.028	.115
8.83	4.89	.08	.028	.113
9.00	4.88	.07	.025	.111
9.17	4.88	.07	.025	.109
9.33	4.88	.07	.025	.107
9.50	4.88	.07	.025	.105
9.67	4.88	.07	.025	.103
9.83	4.88	.07	.025	.102
10.00	4.88	.07	.025	.100
10.17	4.88	.07	.025	.098
10.33	4.87	.06	.021	.097
10.50	4.88	.07	.025	.095
10.67	4.87	.06	.021	.094
10.83	4.87	.06	.021	.092
11.00	4.87	.06	.021	.091
11.17	4.86	.05	.018	.090
11.33	4.87	.06	.021	.088
11.50	4.86	.05	.018	.087
11.67	4.86	.05	.018	.086

WELL # MW-3

WELL DIAMETER= 7.75 INCHES
CASING DIAMETER= 2.00 INCHES
VOLUME OF WATER REMOVED OR ADDED TO WELL= .39 GALLONS
LENGTH OF AQUIFER TESTED= 9.40 FEET
VALUE OF HO= 2.50 FEET
STATIC WATER LEVEL= 4.51 FEET

SLUG TEST DATA:

TIME SINCE TEST BEGAN (MINUTES)	WATER LEVEL (FEET)	DRAWDOWN (FEET)	HEAD RATIO	RECIPROCAL TIME (1/MINUTES)
.17	6.88	2.37	.948	6.001
.33	6.72	2.21	.884	3.000
.50	6.59	2.08	.832	2.000
.67	6.46	1.95	.780	1.500
.83	6.35	1.84	.736	1.200
1.00	6.24	1.73	.692	1.000
1.17	6.15	1.64	.656	.857
1.33	6.06	1.55	.620	.750
1.50	5.98	1.47	.588	.667
1.67	5.90	1.39	.556	.600
1.83	5.83	1.32	.528	.545
2.00	5.76	1.25	.500	.500
2.17	5.69	1.18	.472	.462
2.33	5.63	1.12	.448	.429
2.50	5.58	1.07	.428	.400
2.67	5.51	1.00	.400	.375
2.83	5.47	.96	.384	.353
3.00	5.42	.91	.364	.333
3.17	5.37	.86	.344	.316
3.33	5.33	.82	.328	.300
3.50	5.29	.78	.312	.286
3.67	5.25	.74	.296	.273
3.83	5.21	.70	.280	.261
4.00	5.18	.67	.268	.250
4.17	5.15	.64	.256	.240
4.33	5.11	.60	.240	.231
4.50	5.09	.58	.232	.222
4.67	5.06	.55	.220	.214
4.83	5.04	.53	.212	.207
5.00	5.01	.50	.200	.200
5.17	4.98	.47	.188	.194
5.33	4.96	.45	.180	.188
5.50	4.94	.43	.172	.182
5.67	4.92	.41	.164	.176
5.83	4.91	.40	.160	.171
6.00	4.88	.37	.148	.167
6.17	4.86	.35	.140	.162
6.33	4.85	.34	.136	.158
6.50	4.84	.33	.132	.154
6.67	4.82	.31	.124	.150
6.83	4.81	.30	.120	.146
7.00	4.79	.28	.112	.143

7.17	4.78	.27	.108	.140
7.33	4.77	.26	.104	.136
7.50	4.76	.25	.100	.133
7.67	4.75	.24	.096	.130
7.83	4.73	.22	.088	.128
8.00	4.73	.22	.088	.125
8.17	4.71	.20	.080	.122
8.33	4.71	.20	.080	.120
8.50	4.70	.19	.076	.118
8.67	4.69	.18	.072	.115
8.83	4.68	.17	.068	.113
9.00	4.67	.16	.064	.111
9.17	4.66	.15	.060	.109
9.33	4.65	.14	.056	.107
9.50	4.64	.13	.052	.105
9.67	4.64	.13	.052	.103
9.83	4.64	.13	.052	.102
10.00	4.63	.12	.048	.100
10.17	4.62	.11	.044	.098
10.33	4.62	.11	.044	.097
10.50	4.61	.10	.040	.095
10.67	4.61	.10	.040	.094
10.83	4.60	.09	.036	.092
11.00	4.59	.08	.032	.091
11.17	4.59	.08	.032	.090
11.33	4.58	.07	.028	.088
11.50	4.58	.07	.028	.087
11.67	4.57	.06	.024	.086
11.83	4.57	.06	.024	.085
12.00	4.57	.06	.024	.083
12.17	4.56	.05	.020	.082
12.33	4.56	.05	.020	.081
12.50	4.55	.04	.016	.080
12.67	4.55	.04	.016	.079
12.83	4.55	.04	.016	.078
13.00	4.54	.03	.012	.077
13.17	4.54	.03	.012	.076
13.33	4.54	.03	.012	.075
13.50	4.54	.03	.012	.074
13.67	4.54	.03	.012	.073
13.83	4.54	.03	.012	.072
14.00	4.54	.03	.012	.071
14.17	4.54	.03	.012	.071
14.33	4.54	.03	.012	.070
14.50	4.54	.03	.012	.069
14.67	4.54	.03	.012	.068
14.83	4.54	.03	.012	.067
15.00	4.53	.02	.008	.067
15.17	4.53	.02	.008	.066
15.33	4.53	.02	.008	.065
15.50	4.53	.02	.008	.065
15.67	4.52	.01	.004	.064
15.83	4.52	.01	.004	.063
16.00	4.52	.01	.004	.063
16.17	4.52	.01	.004	.062
16.33	4.52	.01	.004	.061
16.50	4.51	.00	.000	.061
16.67	4.52	.01	.004	.060
16.83	4.52	.01	.004	.059
17.00	4.51	.00	.000	.059

17.17	4.52	.01	.004	.058
17.33	4.51	.00	.000	.058
17.50	4.51	.00	.000	.057

WELL # MW-4

WELL DIAMETER= 7.75 INCHES
CASING DIAMETER= 2.00 INCHES
VOLUME OF WATER REMOVED OR ADDED TO WELL= .36 GALLONS
LENGTH OF AQUIFER TESTED= 9.40 FEET
VALUE OF H0= 2.23 FEET
STATIC WATER LEVEL= 3.84 FEET

SLUG TEST DATA:

TIME SINCE TEST BEGAN (MINUTES)	WATER LEVEL (FEET)	DRAWDOWN (FEET)	HEAD RATIO	RECIPROCAL TIME (1/MINUTES)
.17	6.07	2.23	1.000	6.001
.33	5.96	2.12	.951	3.000
.50	5.88	2.04	.915	2.000
.67	5.81	1.97	.883	1.500
.83	5.75	1.91	.857	1.200
1.00	5.70	1.86	.834	1.000
1.17	5.65	1.81	.812	.857
1.33	5.60	1.76	.789	.750
1.50	5.55	1.71	.767	.667
1.67	5.51	1.67	.749	.600
1.83	5.46	1.62	.726	.545
2.00	5.41	1.57	.704	.500
2.17	5.38	1.54	.691	.462
2.33	5.34	1.50	.673	.429
2.50	5.30	1.46	.655	.400
2.67	5.26	1.42	.637	.375
2.83	5.23	1.39	.623	.353
3.00	5.19	1.35	.605	.333
3.17	5.17	1.33	.596	.316
3.33	5.13	1.29	.578	.300
3.50	5.10	1.26	.565	.286
3.67	5.07	1.23	.552	.273
3.83	5.04	1.20	.538	.261
4.00	5.01	1.17	.525	.250
4.17	4.97	1.13	.507	.240
4.33	4.96	1.12	.502	.231
4.50	4.93	1.09	.489	.222
4.67	4.91	1.07	.480	.214
4.83	4.88	1.04	.466	.207
5.00	4.85	1.01	.453	.200
5.17	4.83	.99	.444	.194
5.33	4.81	.97	.435	.188
5.50	4.78	.94	.422	.182
5.67	4.76	.92	.413	.176
5.83	4.74	.90	.404	.171
6.00	4.72	.88	.395	.167
6.17	4.70	.86	.386	.162
6.33	4.68	.84	.377	.158
6.50	4.65	.81	.363	.154
6.67	4.64	.80	.359	.150
6.83	4.62	.78	.350	.146
7.00	4.59	.75	.336	.143

7.17	4.58	.74	.332	.140
7.33	4.57	.73	.327	.136
7.50	4.55	.71	.318	.133
7.67	4.53	.69	.309	.130
7.83	4.52	.68	.305	.128
8.00	4.51	.67	.300	.125
8.17	4.49	.65	.291	.122
8.33	4.48	.64	.287	.120
8.50	4.46	.62	.278	.118
8.67	4.44	.60	.269	.115
8.83	4.43	.59	.265	.113
9.00	4.42	.58	.260	.111
9.17	4.41	.57	.256	.109
9.33	4.39	.55	.247	.107
9.50	4.38	.54	.242	.105
9.67	4.37	.53	.238	.103
9.83	4.36	.52	.233	.102
10.00	4.34	.50	.224	.100
10.17	4.34	.50	.224	.098
10.33	4.32	.48	.215	.097
10.50	4.32	.48	.215	.095
10.67	4.31	.47	.211	.094
10.83	4.31	.47	.211	.092
11.00	4.15	.31	.139	.091
11.17	4.29	.45	.202	.090
11.33	4.28	.44	.197	.088
11.50	4.27	.43	.193	.087
11.67	4.25	.41	.184	.086
11.83	4.24	.40	.179	.085
12.00	4.24	.40	.179	.083
12.17	4.22	.38	.170	.082
12.33	4.21	.37	.166	.081
12.50	4.21	.37	.166	.080
12.67	4.20	.36	.161	.079
12.83	4.20	.36	.161	.078
13.00	4.18	.34	.152	.077
13.17	4.18	.34	.152	.076
13.33	4.17	.33	.148	.075
13.50	4.17	.33	.148	.074
13.67	4.16	.32	.143	.073
13.83	4.16	.32	.143	.072
14.00	4.15	.31	.139	.071
14.17	4.14	.30	.135	.071
14.33	4.14	.30	.135	.070
14.50	4.13	.29	.130	.069
14.67	4.12	.28	.126	.068
14.83	4.12	.28	.126	.067
15.00	4.11	.27	.121	.067
15.17	4.11	.27	.121	.066
15.33	4.11	.27	.121	.065
15.50	4.10	.26	.117	.065
15.67	4.10	.26	.117	.064
15.83	4.08	.24	.108	.063
16.00	4.08	.24	.108	.063
16.17	4.07	.23	.103	.062
16.33	4.07	.23	.103	.061
16.50	4.06	.22	.099	.061
16.67	4.06	.22	.099	.060
16.83	4.05	.21	.094	.059
17.00	4.05	.21	.094	.059

17.17	4.05	.21	.094	.058
17.33	4.04	.20	.090	.058
17.50	4.04	.20	.090	.057
17.67	4.04	.20	.090	.057
17.83	4.04	.20	.090	.056
18.00	4.03	.19	.085	.056
18.17	4.02	.18	.081	.055
18.33	3.96	.12	.054	.055
18.50	4.02	.18	.081	.054
18.67	4.01	.17	.076	.054
18.83	4.00	.16	.072	.053
19.00	4.00	.16	.072	.053
19.17	4.00	.16	.072	.052
19.33	3.99	.15	.067	.052
19.50	3.99	.15	.067	.051
19.67	3.99	.15	.067	.051
19.83	3.98	.14	.063	.050
20.00	3.99	.15	.067	.050
20.17	3.98	.14	.063	.050
20.33	3.98	.14	.063	.049
20.50	3.98	.14	.063	.049
20.67	3.98	.14	.063	.048
20.83	3.98	.14	.063	.048
21.00	3.97	.13	.058	.048
21.17	3.97	.13	.058	.047
21.33	3.97	.13	.058	.047
21.50	3.97	.13	.058	.047
21.67	3.97	.13	.058	.046
21.83	3.97	.13	.058	.046
22.00	3.96	.12	.054	.045
22.17	3.96	.12	.054	.045
22.33	3.96	.12	.054	.045
22.50	3.96	.12	.054	.044
22.67	3.95	.11	.049	.044
22.83	3.95	.11	.049	.044
23.00	3.95	.11	.049	.043
23.17	3.95	.11	.049	.043
23.33	3.95	.11	.049	.043
23.50	3.95	.11	.049	.043
23.67	3.94	.10	.045	.042
23.83	3.94	.10	.045	.042
24.00	3.94	.10	.045	.042
24.17	3.93	.09	.040	.041
24.33	3.93	.09	.040	.041
24.50	3.93	.09	.040	.041
24.67	3.92	.08	.036	.041
24.83	3.92	.08	.036	.040
25.00	3.92	.08	.036	.040
25.17	3.92	.08	.036	.040
25.33	3.92	.08	.036	.039
25.50	3.91	.07	.031	.039
25.67	3.91	.07	.031	.039
25.83	3.91	.07	.031	.039
26.00	3.91	.07	.031	.038
26.17	3.91	.07	.031	.038
26.33	3.91	.07	.031	.038
26.50	3.90	.06	.027	.038
26.67	3.90	.06	.027	.038
26.83	3.89	.05	.022	.037
27.00	3.89	.05	.022	.037

27.17	3.89	.05	.022	.037
27.33	3.89	.05	.022	.037
27.50	3.89	.05	.022	.036
27.67	3.89	.05	.022	.036
27.83	3.88	.04	.018	.036
28.00	3.88	.04	.018	.036
28.17	3.87	.03	.013	.036
28.33	3.87	.03	.013	.035
28.50	3.87	.03	.013	.035
28.67	3.87	.03	.013	.035
28.83	3.87	.03	.013	.035
29.00	3.87	.03	.013	.034
29.17	3.87	.03	.013	.034
29.33	3.86	.02	.009	.034
29.50	3.87	.03	.013	.034
29.67	3.86	.02	.009	.034
29.83	3.86	.02	.009	.034
30.00	3.85	.01	.004	.033
30.17	3.85	.01	.004	.033
30.33	3.84	.00	.000	.033
30.50	3.85	.01	.004	.033
30.67	3.84	.00	.000	.033
30.83	3.84	.00	.000	.032

WELL # MW-5

WELL DIAMETER= 7.75 INCHES
CASING DIAMETER= 2.00 INCHES
VOLUME OF WATER REMOVED OR ADDED TO WELL= .15 GALLONS
LENGTH OF AQUIFER TESTED= 9.40 FEET
VALUE OF HO= .95 FEET
STATIC WATER LEVEL= 6.31 FEET

SLUG TEST DATA:

TIME SINCE TEST BEGAN (MINUTES)	WATER LEVEL (FEET)	DRAWDOWN (FEET)	HEAD RATIO	RECIPROCAL TIME (1/MINUTES)
.25	7.26	.95	1.000	4.000
.50	7.22	.91	.958	2.000
.75	7.18	.87	.916	1.333
1.00	7.16	.85	.895	1.000
1.25	7.15	.84	.884	.800
1.50	7.13	.82	.863	.667
1.75	7.11	.80	.842	.571
2.00	7.10	.79	.832	.500
2.25	7.08	.77	.811	.444
2.50	7.06	.75	.789	.400
2.75	7.04	.73	.768	.364
3.00	7.02	.71	.747	.333
3.25	7.00	.69	.726	.308
3.50	6.97	.66	.695	.286
3.75	6.95	.64	.674	.267
4.00	6.93	.62	.653	.250
4.25	6.91	.60	.632	.235
4.50	6.88	.57	.600	.222
4.75	6.85	.54	.568	.211
5.00	6.83	.52	.547	.200
5.25	6.81	.50	.526	.190
5.50	6.78	.47	.495	.182
5.75	6.75	.44	.463	.174
6.00	6.71	.40	.421	.167
6.25	6.69	.38	.400	.160
6.50	6.69	.38	.400	.154
6.75	6.67	.36	.379	.148
7.00	6.65	.34	.358	.143
7.25	6.65	.34	.358	.138
7.50	6.64	.33	.347	.133
7.75	6.63	.32	.337	.129
8.00	6.62	.31	.326	.125
8.25	6.62	.31	.326	.121
8.50	6.61	.30	.316	.118
8.75	6.61	.30	.316	.114
9.00	6.61	.30	.316	.111
9.25	6.59	.28	.295	.108
9.50	6.59	.28	.295	.105
9.75	6.59	.28	.295	.103
10.00	6.58	.27	.284	.100
10.25	6.58	.27	.284	.098
10.50	6.57	.26	.274	.095

10.75	6.57	.26	.274	.093
11.00	6.56	.25	.263	.091
11.25	6.56	.25	.263	.089
11.50	6.55	.24	.253	.087
11.75	6.55	.24	.253	.085
12.00	6.54	.23	.242	.083
12.25	6.54	.23	.242	.082
12.50	6.53	.22	.232	.080
12.75	6.53	.22	.232	.078
13.00	6.52	.21	.221	.077
13.25	6.52	.21	.221	.075
13.50	6.52	.21	.221	.074
13.75	6.52	.21	.221	.073
14.00	6.53	.22	.232	.071
14.25	6.53	.22	.232	.070
14.50	6.53	.22	.232	.069
14.75	6.53	.22	.232	.068
15.00	6.52	.21	.221	.067
15.25	6.51	.20	.211	.066
15.50	6.51	.20	.211	.065
15.75	6.51	.20	.211	.063
16.00	6.51	.20	.211	.062
16.25	6.50	.19	.200	.062
16.50	6.50	.19	.200	.061
16.75	6.50	.19	.200	.060
17.00	6.49	.18	.189	.059
17.25	6.49	.18	.189	.058
17.50	6.49	.18	.189	.057
17.75	6.49	.18	.189	.056
18.00	6.48	.17	.179	.056
18.25	6.48	.17	.179	.055
18.50	6.48	.17	.179	.054
18.75	6.47	.16	.168	.053
19.00	6.47	.16	.168	.053
19.25	6.47	.16	.168	.052
19.50	6.46	.15	.158	.051
19.75	6.46	.15	.158	.051
20.00	6.46	.15	.158	.050
20.25	6.45	.14	.147	.049
20.50	6.44	.13	.137	.049
20.75	6.44	.13	.137	.048
21.00	6.44	.13	.137	.048
21.25	6.44	.13	.137	.047
21.50	6.44	.13	.137	.047
21.75	6.44	.13	.137	.046
22.00	6.44	.13	.137	.045
22.25	6.44	.13	.137	.045
22.50	6.44	.13	.137	.044
22.75	6.44	.13	.137	.044
23.00	6.43	.12	.126	.043
23.25	6.43	.12	.126	.043
23.50	6.42	.11	.116	.043
23.75	6.42	.11	.116	.042
24.00	6.42	.11	.116	.042
24.25	6.42	.11	.116	.041
24.50	6.41	.10	.105	.041
24.75	6.41	.10	.105	.040
25.00	6.41	.10	.105	.040
25.25	6.41	.10	.105	.040
25.50	6.40	.09	.095	.039

25.75	6.40	.09	.095	.039
26.00	6.39	.08	.084	.038
26.25	6.39	.08	.084	.038
26.50	6.39	.08	.084	.038
26.75	6.39	.08	.084	.037
27.00	6.39	.08	.084	.037
27.25	6.38	.07	.074	.037
27.50	6.38	.07	.074	.036
27.75	6.38	.07	.074	.036
28.00	6.38	.07	.074	.036
28.25	6.38	.07	.074	.035
28.50	6.38	.07	.074	.035
28.75	6.37	.06	.063	.035
29.00	6.37	.06	.063	.034
29.25	6.37	.06	.063	.034
29.50	6.37	.06	.063	.034
29.75	6.37	.06	.063	.034
30.00	6.37	.06	.063	.033
30.25	6.37	.06	.063	.033
30.50	6.37	.06	.063	.033
30.75	6.37	.06	.063	.033
31.00	6.37	.06	.063	.032
31.25	6.36	.05	.053	.032
31.50	6.36	.05	.053	.032
31.75	6.36	.05	.053	.031
32.00	6.35	.04	.042	.031
32.25	6.34	.03	.032	.031
32.50	6.34	.03	.032	.031
32.75	6.34	.03	.032	.031
33.00	6.34	.03	.032	.030
33.25	6.34	.03	.032	.030
33.50	6.34	.03	.032	.030
33.75	6.34	.03	.032	.030
34.00	6.33	.02	.021	.029
34.25	6.33	.02	.021	.029
34.50	6.33	.02	.021	.029
34.75	6.32	.01	.011	.029
35.00	6.32	.01	.011	.029
35.25	6.32	.01	.011	.028
35.50	6.32	.01	.011	.028
35.75	6.31	.00	.000	.028

WELL # MW-6

WELL DIAMETER= 7.75 INCHES
CASING DIAMETER= 4.00 INCHES
VOLUME OF WATER REMOVED OR ADDED TO WELL= 1.24 GALLONS
LENGTH OF AQUIFER TESTED= 13.70 FEET
VALUE OF H0= 2.10 FEET
STATIC WATER LEVEL= 3.87 FEET

SLUG TEST DATA:

TIME SINCE TEST BEGAN (MINUTES)	WATER LEVEL (FEET)	DRAWDOWN (FEET)	HEAD RATIO	RECIPROCAL TIME (1/MINUTES)
.25	5.78	1.91	.910	4.000
.50	5.56	1.69	.805	2.000
.75	5.40	1.53	.729	1.333
1.00	5.27	1.40	.667	1.000
1.25	5.16	1.29	.614	.800
1.50	5.07	1.20	.571	.667
1.75	4.98	1.11	.529	.571
2.00	4.90	1.03	.490	.500
2.25	4.83	.96	.457	.444
2.50	4.77	.90	.429	.400
2.75	4.71	.84	.400	.364
3.00	4.65	.78	.371	.333
3.25	4.61	.74	.352	.308
3.50	4.56	.69	.329	.286
3.75	4.51	.64	.305	.267
4.00	4.47	.60	.286	.250
4.25	4.44	.57	.271	.235
4.50	4.41	.54	.257	.222
4.75	4.37	.50	.238	.211
5.00	4.34	.47	.224	.200
5.25	4.31	.44	.210	.190
5.50	4.29	.42	.200	.182
5.75	4.26	.39	.186	.174
6.00	4.24	.37	.176	.167
6.25	4.21	.34	.162	.160
6.50	4.19	.32	.152	.154
6.75	4.18	.31	.148	.148
7.00	4.22	.35	.167	.143
7.25	4.20	.33	.157	.138
7.50	4.19	.32	.152	.133
7.75	4.17	.30	.143	.129
8.00	4.16	.29	.138	.125
8.25	4.14	.27	.129	.121
8.50	4.13	.26	.124	.118
8.75	4.12	.25	.119	.114
9.00	4.11	.24	.114	.111
9.25	4.09	.22	.105	.108
9.50	4.09	.22	.105	.105
9.75	4.07	.20	.095	.103
10.00	4.06	.19	.090	.100
10.25	4.05	.18	.086	.098
10.50	4.04	.17	.081	.095

10.75	4.04	.17	.081	.093
11.00	4.03	.16	.076	.091
11.25	4.01	.14	.067	.089
11.50	4.01	.14	.067	.087
11.75	4.00	.13	.062	.085
12.00	3.99	.12	.057	.083
12.25	3.99	.12	.057	.082
12.50	3.98	.11	.052	.080
12.75	3.97	.10	.048	.078
13.00	3.97	.10	.048	.077
13.25	3.96	.09	.043	.075
13.50	3.96	.09	.043	.074
13.75	3.96	.09	.043	.073
14.00	3.95	.08	.038	.071
14.25	3.95	.08	.038	.070
14.50	3.95	.08	.038	.069
14.75	3.94	.07	.033	.068
15.00	3.93	.06	.029	.067
15.25	3.93	.06	.029	.066
15.50	3.93	.06	.029	.065
15.75	3.92	.05	.024	.063
16.00	3.92	.05	.024	.063
16.25	3.91	.04	.019	.062
16.50	3.91	.04	.019	.061
16.75	3.91	.04	.019	.060
17.00	3.91	.04	.019	.059
17.25	3.90	.03	.014	.058
17.50	3.90	.03	.014	.057
17.75	3.90	.03	.014	.056
18.00	3.90	.03	.014	.056
18.25	3.90	.03	.014	.055
18.50	3.90	.03	.014	.054
18.75	3.90	.03	.014	.053
19.00	3.90	.03	.014	.053
19.25	3.89	.02	.010	.052
19.50	3.89	.02	.010	.051
19.75	3.89	.02	.010	.051
20.00	3.88	.01	.005	.050
20.25	3.88	.01	.005	.049
20.50	3.88	.01	.005	.049
20.75	3.87	.00	.000	.048

WELL # DH-41

WELL DIAMETER= 8.25 INCHES
CASING DIAMETER= 2.00 INCHES
VOLUME OF WATER REMOVED OR ADDED TO WELL= .60 GALLONS
LENGTH OF AQUIFER TESTED= 13.70 FEET
VALUE OF HO= 3.93 FEET
STATIC WATER LEVEL= 7.28 FEET

SLUG TEST DATA:

TIME SINCE TEST BEGAN (MINUTES)	WATER LEVEL (FEET)	DRAWDOWN (FEET)	HEAD RATIO	RECIPROCAL TIME (1/MINUTES)
.17	10.77	3.49	.888	5.999
.25	10.44	3.16	.804	4.000
.33	10.40	3.12	.794	3.000
.42	10.14	2.86	.728	2.400
.50	10.11	2.83	.720	2.000
.58	10.01	2.73	.695	1.714
.67	9.92	2.64	.672	1.500
.75	9.83	2.55	.649	1.333
.83	9.75	2.47	.628	1.200
.92	9.61	2.33	.593	1.091
1.00	9.59	2.31	.588	1.000
1.08	9.53	2.25	.573	.923
1.17	9.47	2.19	.557	.857
1.25	9.34	2.06	.524	.800
1.33	9.23	1.95	.496	.750
1.42	9.22	1.94	.494	.706
1.50	9.08	1.80	.458	.667
1.58	9.06	1.78	.453	.632
1.67	9.05	1.77	.450	.600
1.75	9.02	1.74	.443	.571
1.83	8.95	1.67	.425	.545
1.92	8.93	1.65	.420	.522
2.00	8.89	1.61	.410	.500
2.08	8.85	1.57	.399	.480
2.17	8.82	1.54	.392	.462
2.25	8.78	1.50	.382	.444
2.33	8.75	1.47	.374	.429
2.42	8.71	1.43	.364	.414
2.50	8.68	1.40	.356	.400
2.58	8.65	1.37	.349	.387
2.67	8.57	1.29	.328	.375
2.75	8.56	1.28	.326	.364
2.83	8.56	1.28	.326	.353
2.92	8.53	1.25	.318	.343
3.00	8.50	1.22	.310	.333
3.08	8.48	1.20	.305	.324
3.17	8.45	1.17	.298	.316
3.25	8.42	1.14	.290	.308
3.33	8.39	1.11	.282	.300
3.42	8.37	1.09	.277	.293
3.50	8.35	1.07	.272	.286
3.58	8.32	1.04	.265	.279

3.67	8.30	1.02	.260	.273
3.75	8.27	.99	.252	.267
3.83	8.25	.97	.247	.261
3.92	8.23	.95	.242	.255
4.00	8.21	.93	.237	.250
4.08	8.19	.91	.232	.245
4.17	8.17	.89	.226	.240
4.25	8.15	.87	.221	.235
4.33	8.11	.83	.211	.231
4.42	8.10	.82	.209	.226
4.50	8.07	.79	.201	.222
4.58	8.06	.78	.198	.218
4.67	8.05	.77	.196	.214
4.75	7.97	.69	.176	.211
4.83	7.97	.69	.176	.207
4.92	7.96	.68	.173	.203
5.00	7.96	.68	.173	.200
5.08	7.97	.69	.176	.197
5.17	7.96	.68	.173	.194
5.25	7.94	.66	.168	.190
5.33	7.92	.64	.163	.187
5.42	7.91	.63	.160	.185
5.50	7.90	.62	.158	.182
5.58	7.88	.60	.153	.179
5.67	7.87	.59	.150	.176
5.75	7.85	.57	.145	.174
5.83	7.84	.56	.142	.171
5.92	7.83	.55	.140	.169
6.00	7.82	.54	.137	.167
6.08	7.80	.52	.132	.164
6.17	7.79	.51	.130	.162
6.25	7.78	.50	.127	.160
6.33	7.76	.48	.122	.158
6.42	7.75	.47	.120	.156
6.50	7.74	.46	.117	.154
6.58	7.73	.45	.115	.152
6.67	7.72	.44	.112	.150
6.75	7.71	.43	.109	.148
6.83	7.70	.42	.107	.146
6.92	7.69	.41	.104	.145
7.00	7.67	.39	.099	.143
7.08	7.67	.39	.099	.141
7.17	7.66	.38	.097	.140
7.25	7.64	.36	.092	.138
7.33	7.63	.35	.089	.136
7.42	7.62	.34	.087	.135
7.50	7.62	.34	.087	.133
7.58	7.61	.33	.084	.132
7.67	7.60	.32	.081	.130
7.75	7.59	.31	.079	.129
7.83	7.58	.30	.076	.128
7.92	7.57	.29	.074	.126
8.00	7.56	.28	.071	.125
8.08	7.55	.27	.069	.124
8.17	7.55	.27	.069	.122
8.25	7.54	.26	.066	.121
8.33	7.53	.25	.064	.120
8.42	7.52	.24	.061	.119
8.50	7.51	.23	.059	.118
8.58	7.50	.22	.056	.117

8.67	7.49	.21	.053	.115
8.75	7.48	.20	.051	.114
8.83	7.47	.19	.048	.113
8.92	7.47	.19	.048	.112
9.00	7.46	.18	.046	.111
9.08	7.46	.18	.046	.110
9.17	7.45	.17	.043	.109
9.25	7.44	.16	.041	.108
9.33	7.44	.16	.041	.107
9.42	7.43	.15	.038	.106
9.50	7.43	.15	.038	.105
9.58	7.43	.15	.038	.104
9.67	7.42	.14	.036	.103
9.75	7.41	.13	.033	.103
9.83	7.41	.13	.033	.102
9.92	7.40	.12	.031	.101
10.00	7.49	.21	.053	.100
10.08	7.49	.21	.053	.099
10.17	7.48	.20	.051	.098
10.25	7.48	.20	.051	.098
10.33	7.37	.09	.023	.097
10.42	7.37	.09	.023	.096
10.50	7.36	.08	.020	.095
10.58	7.36	.08	.020	.094
10.67	7.35	.07	.018	.094
10.75	7.34	.06	.015	.093
10.83	7.34	.06	.015	.092
10.92	7.33	.05	.013	.092
11.00	7.33	.05	.013	.091
11.08	7.32	.04	.010	.090
11.17	7.32	.04	.010	.090
11.25	7.31	.03	.008	.089
11.33	7.31	.03	.008	.088
11.42	7.30	.02	.005	.088
11.50	7.30	.02	.005	.087
11.58	7.29	.01	.003	.086
11.67	7.29	.01	.003	.086
11.75	7.28	.00	.000	.085

WELL # DH-42

WELL DIAMETER= 8.25 INCHES
CASING DIAMETER= 2.00 INCHES
VOLUME OF WATER REMOVED OR ADDED TO WELL= .56 GALLONS
LENGTH OF AQUIFER TESTED= 9.40 FEET
VALUE OF H0= 3.66 FEET
STATIC WATER LEVEL= 10.68 FEET

SLUG TEST DATA:

TIME SINCE TEST BEGAN (MINUTES)	WATER LEVEL (FEET)	DRAWDOWN (FEET)	HEAD RATIO	RECIPROCAL TIME (1/MINUTES)
.08	14.12	3.44	.940	11.998
.17	14.09	3.41	.932	5.999
.25	14.00	3.32	.907	4.000
.42	13.65	2.97	.811	2.400
.50	13.44	2.76	.754	2.000
.58	13.00	2.32	.634	1.714
.67	13.00	2.32	.634	1.500
.75	12.99	2.31	.631	1.333
.83	12.84	2.16	.590	1.200
.92	12.53	1.85	.505	1.091
1.00	12.50	1.82	.497	1.000
1.25	12.57	1.89	.516	.800
1.42	12.49	1.81	.495	.706
1.50	12.49	1.81	.495	.667
1.58	12.46	1.78	.486	.632
1.67	12.36	1.68	.459	.600
1.83	12.33	1.65	.451	.545
1.92	12.33	1.65	.451	.522
2.00	12.36	1.68	.459	.500
2.08	12.36	1.68	.459	.480
2.17	12.32	1.64	.448	.462
2.25	12.32	1.64	.448	.444
2.33	12.31	1.63	.445	.429
2.42	12.30	1.62	.443	.414
2.50	12.28	1.60	.437	.400
2.58	12.26	1.58	.432	.387
2.67	12.24	1.56	.426	.375
2.75	12.23	1.55	.423	.364
2.83	12.21	1.53	.418	.353
3.42	12.11	1.43	.391	.293
3.83	12.04	1.36	.372	.261
3.92	12.02	1.34	.366	.255
4.00	12.01	1.33	.363	.250
4.08	11.95	1.27	.347	.245
4.25	11.97	1.29	.352	.235
4.33	11.96	1.28	.350	.231
4.42	11.95	1.27	.347	.226
4.50	11.94	1.26	.344	.222
4.58	11.91	1.23	.336	.218
4.67	11.91	1.23	.336	.214
4.83	11.89	1.21	.331	.207
4.92	11.81	1.13	.309	.203

5.00	11.78	1.10	.301	.200
5.08	11.78	1.10	.301	.197
5.17	11.78	1.10	.301	.194
5.25	11.81	1.13	.309	.190
5.33	11.81	1.13	.309	.187
5.42	11.82	1.14	.311	.185
5.50	11.80	1.12	.306	.182
5.58	11.78	1.10	.301	.179
5.67	11.78	1.10	.301	.176
5.75	11.78	1.10	.301	.174
5.83	11.77	1.09	.298	.171
6.00	11.75	1.07	.292	.167
6.08	11.74	1.06	.290	.164
6.17	11.73	1.05	.287	.162
6.25	11.72	1.04	.284	.160
6.42	11.69	1.01	.276	.156
6.50	11.54	.86	.235	.154
6.58	11.67	.99	.270	.152
6.67	11.66	.98	.268	.150
6.83	11.51	.83	.227	.146
8.33	11.49	.81	.221	.120
8.50	11.48	.80	.219	.118
8.58	11.47	.79	.216	.117
8.75	11.46	.78	.213	.114
8.92	11.44	.76	.208	.112
9.17	11.43	.75	.205	.109
9.25	11.42	.74	.202	.108
9.33	11.41	.73	.199	.107
9.42	11.40	.72	.197	.106
9.50	11.40	.72	.197	.105
9.58	11.39	.71	.194	.104
9.67	11.38	.70	.191	.103
9.75	11.37	.69	.189	.103
9.83	11.37	.69	.189	.102
9.92	11.37	.69	.189	.101
10.00	11.32	.64	.175	.100
10.08	11.32	.64	.175	.099
10.17	11.26	.58	.158	.098
10.25	11.26	.58	.158	.098
10.33	11.27	.59	.161	.097
10.42	11.31	.63	.172	.096
10.50	11.26	.58	.158	.095
10.58	11.24	.56	.153	.094
10.67	11.23	.55	.150	.094
10.75	11.23	.55	.150	.093
10.83	11.23	.55	.150	.092
10.92	11.23	.55	.150	.092
11.00	11.23	.55	.150	.091
11.08	11.23	.55	.150	.090
11.17	11.27	.59	.161	.090
11.25	11.28	.60	.164	.089
11.33	11.26	.58	.158	.088
11.42	11.27	.59	.161	.088
11.50	11.27	.59	.161	.087
11.58	11.26	.58	.158	.086
11.67	11.24	.56	.153	.086
11.75	11.24	.56	.153	.085
11.83	11.23	.55	.150	.085
11.92	11.23	.55	.150	.084
12.00	11.24	.56	.153	.083

12.08	11.23	.55	.150	.083
12.17	11.23	.55	.150	.082
12.25	11.23	.55	.150	.082
12.33	11.22	.54	.148	.081
12.42	11.21	.53	.145	.081
12.50	11.21	.53	.145	.080
12.58	11.20	.52	.142	.079
12.67	11.20	.52	.142	.079
12.75	11.20	.52	.142	.078
12.83	11.19	.51	.139	.078
13.08	11.17	.49	.134	.076
13.17	11.17	.49	.134	.076
13.25	11.16	.48	.131	.075
13.33	11.16	.48	.131	.075
13.42	11.15	.47	.128	.075
13.50	11.14	.46	.126	.074
13.58	11.14	.46	.126	.074
13.67	11.14	.46	.126	.073
13.75	11.13	.45	.123	.073
13.83	11.13	.45	.123	.072
13.92	11.13	.45	.123	.072
14.08	11.12	.44	.120	.071
14.17	11.12	.44	.120	.071
14.25	11.11	.43	.117	.070
14.33	11.11	.43	.117	.070
14.42	11.10	.42	.115	.069
14.50	11.10	.42	.115	.069
14.58	11.09	.41	.112	.069
14.75	11.09	.41	.112	.068
15.08	10.89	.21	.057	.066
15.17	10.72	.04	.011	.066
15.25	10.70	.02	.005	.066
15.33	10.68	.00	.000	.065

WELL # DH-43

WELL DIAMETER= 8.25 INCHES
CASING DIAMETER= 2.00 INCHES
VOLUME OF WATER REMOVED OR ADDED TO WELL= .70 GALLONS
LENGTH OF AQUIFER TESTED= 5.60 FEET
VALUE OF H0= 4.59 FEET
STATIC WATER LEVEL= 10.27 FEET

SLUG TEST DATA:

TIME SINCE TEST BEGAN (MINUTES)	WATER LEVEL (FEET)	DRAWDOWN (FEET)	HEAD RATIO	RECIPROCAL TIME (1/MINUTES)
.17	14.54	4.27	.930	6.001
.33	14.39	4.12	.898	3.000
.50	14.09	3.82	.832	2.000
.83	13.65	3.38	.736	1.200
1.00	13.43	3.16	.688	1.000
1.17	13.24	2.97	.647	.857
1.33	13.06	2.79	.608	.750
1.50	12.90	2.63	.573	.667
1.67	12.46	2.19	.477	.600
1.83	12.33	2.06	.449	.545
2.17	12.36	2.09	.455	.462
2.33	11.91	1.64	.357	.429
2.50	11.80	1.53	.333	.400
2.67	11.78	1.51	.329	.375
3.00	11.85	1.58	.344	.333
3.17	11.79	1.52	.331	.316
3.50	11.66	1.39	.303	.286
4.00	11.40	1.13	.246	.250
4.17	11.40	1.13	.246	.240
4.33	11.39	1.12	.244	.231
4.50	11.27	1.00	.218	.222
4.83	11.26	.99	.216	.207
5.00	11.22	.95	.207	.200
5.33	11.15	.88	.192	.188
5.50	11.12	.85	.185	.182
5.67	10.91	.64	.139	.176
5.83	10.89	.62	.135	.171
6.83	10.87	.60	.131	.146
7.00	10.89	.62	.135	.143
7.17	10.87	.60	.131	.140
7.33	10.85	.58	.126	.136
7.50	10.84	.57	.124	.133
7.67	10.82	.55	.120	.130
7.83	10.72	.45	.098	.128
8.00	10.75	.48	.105	.125
8.17	10.68	.41	.089	.122
8.33	10.68	.41	.089	.120
8.50	10.72	.45	.098	.118
8.67	10.72	.45	.098	.115
8.83	10.72	.45	.098	.113
9.00	10.70	.43	.094	.111
9.17	10.68	.41	.089	.109

9.33	10.68	.41	.089	.107
9.50	10.68	.41	.089	.105
9.67	10.68	.41	.089	.103
9.83	10.68	.41	.089	.102
10.00	10.67	.40	.087	.100
10.17	10.66	.39	.085	.098
10.33	10.65	.38	.083	.097
10.50	10.46	.19	.041	.095
10.67	10.27	.00	.000	.094

SYRO STEEL

WELL # DH-45

WELL DIAMETER= 8.25 INCHES
CASING DIAMETER= 2.00 INCHES
VOLUME OF WATER REMOVED OR ADDED TO WELL= .72 GALLONS
LENGTH OF AQUIFER TESTED= 4.50 FEET
VALUE OF HO= 4.92 FEET
STATIC WATER LEVEL= 4.68 FEET

SLUG TEST DATA:

TIME SINCE TEST BEGAN (MINUTES)	WATER LEVEL (FEET)	DRAWDOWN (FEET)	HEAD RATIO	RECIPROCAL TIME (1/MINUTES)
.17	9.06	4.38	.890	5.999
.33	8.56	3.88	.789	3.000
.50	7.97	3.29	.669	2.000
.67	7.41	2.73	.555	1.500
.83	7.18	2.50	.508	1.200
1.00	7.04	2.36	.480	1.000
1.17	6.80	2.12	.431	.857
1.33	6.58	1.90	.386	.750
1.50	6.36	1.68	.341	.667
1.67	6.23	1.55	.315	.600
2.00	5.93	1.25	.254	.500
2.17	5.78	1.10	.224	.462
2.33	5.73	1.05	.213	.429
2.50	5.64	.96	.195	.400
2.83	5.47	.79	.161	.353
3.00	5.40	.72	.146	.333
3.17	5.23	.55	.112	.316
3.33	5.24	.56	.114	.300
3.50	5.23	.55	.112	.286
3.67	5.18	.50	.102	.273
3.83	5.14	.46	.093	.261
4.00	5.10	.42	.085	.250
4.17	4.69	.01	.002	.240
4.33	4.69	.01	.002	.231
4.50	4.70	.02	.004	.222
4.67	4.70	.02	.004	.214
4.83	4.68	.00	.000	.207

WELL # SYRO WELL

WELL DIAMETER= 8.25 INCHES
CASING DIAMETER= 2.00 INCHES
VOLUME OF WATER REMOVED OR ADDED TO WELL= .31 GALLONS
LENGTH OF AQUIFER TESTED= 9.40 FEET
VALUE OF H0= 2.02 FEET
STATIC WATER LEVEL= 3.73 FEET

SLUG TEST DATA:

TIME SINCE TEST BEGAN (MINUTES)	WATER LEVEL (FEET)	DRAWDOWN (FEET)	HEAD RATIO	RECIPROCAL TIME (1/MINUTES)
.25	5.65	1.92	.950	4.000
.50	5.59	1.86	.921	2.000
.75	5.53	1.80	.891	1.333
1.00	5.46	1.73	.856	1.000
1.25	5.38	1.65	.817	.800
1.50	5.31	1.58	.782	.667
1.75	5.25	1.52	.752	.571
2.00	5.18	1.45	.718	.500
2.25	5.12	1.39	.688	.444
2.50	5.06	1.33	.658	.400
2.75	5.01	1.28	.634	.364
3.00	4.95	1.22	.604	.333
3.25	4.90	1.17	.579	.308
3.50	4.85	1.12	.554	.286
3.75	4.80	1.07	.530	.267
4.00	4.75	1.02	.505	.250
4.25	4.71	.98	.485	.235
4.50	4.66	.93	.460	.222
4.75	4.63	.90	.446	.211
5.00	4.58	.85	.421	.200
5.25	4.53	.80	.396	.190
5.50	4.49	.76	.376	.182
5.75	4.46	.73	.361	.174
6.00	4.42	.69	.342	.167
6.25	4.39	.66	.327	.160
6.50	4.35	.62	.307	.154
6.75	4.32	.59	.292	.148
7.00	4.28	.55	.272	.143
7.25	4.25	.52	.257	.138
7.50	4.22	.49	.243	.133
7.75	4.19	.46	.228	.129
8.00	4.16	.43	.213	.125
8.25	4.14	.41	.203	.121
8.50	4.11	.38	.188	.118
8.75	4.08	.35	.173	.114
9.00	4.06	.33	.163	.111
9.25	4.03	.30	.149	.108
9.50	4.01	.28	.139	.105
9.75	3.99	.26	.129	.103
10.00	3.97	.24	.119	.100
10.25	3.94	.21	.104	.098
10.50	3.92	.19	.094	.095

10.75	3.89	.16	.079	.093
11.00	3.87	.14	.069	.091
11.25	3.85	.12	.059	.089
11.50	3.82	.09	.045	.087
11.75	3.81	.08	.040	.085
12.00	3.78	.05	.025	.083
12.25	3.77	.04	.020	.082
12.50	3.75	.02	.010	.080
12.75	3.74	.01	.005	.078
13.00	3.74	.01	.005	.077
13.25	3.73	.00	.000	.075

SYRO STEEL

WELL # UG-WELL

WELL DIAMETER= 8.25 INCHES
CASING DIAMETER= 2.00 INCHES
VOLUME OF WATER REMOVED OR ADDED TO WELL= .14 GALLONS
LENGTH OF AQUIFER TESTED= 7.00 FEET
VALUE OF H0= .92 FEET
STATIC WATER LEVEL= 1.47 FEET

SLUG TEST DATA:

TIME SINCE TEST BEGAN (MINUTES)	WATER LEVEL (FEET)	DRAWDOWN (FEET)	HEAD RATIO	RECIPROCAL TIME (1/MINUTES)
.25	2.34	.87	.946	4.000
.50	2.30	.83	.902	2.000
.75	2.25	.78	.848	1.333
1.00	2.22	.75	.815	1.000
1.25	2.18	.71	.772	.800
1.50	2.14	.67	.728	.667
1.75	2.11	.64	.696	.571
2.00	2.08	.61	.663	.500
2.25	2.04	.57	.620	.444
2.50	2.01	.54	.587	.400
2.75	1.98	.51	.554	.364
3.00	1.95	.48	.522	.333
3.25	1.92	.45	.489	.308
3.50	1.90	.43	.467	.286
3.75	1.88	.41	.446	.267
4.00	1.87	.40	.435	.250
4.25	1.84	.37	.402	.235
4.50	1.83	.36	.391	.222
4.75	1.80	.33	.359	.211
5.00	1.80	.33	.359	.200
5.25	1.78	.31	.337	.190
5.50	1.77	.30	.326	.182
5.75	1.75	.28	.304	.174
6.00	1.74	.27	.293	.167
6.25	1.73	.26	.283	.160
6.50	1.71	.24	.261	.154
6.75	1.70	.23	.250	.148
7.00	1.69	.22	.239	.143
7.25	1.68	.21	.228	.138
7.50	1.67	.20	.217	.133
7.75	1.65	.18	.196	.129
8.00	1.64	.17	.185	.125
8.25	1.64	.17	.185	.121
8.50	1.62	.15	.163	.118
8.75	1.61	.14	.152	.114
9.00	1.60	.13	.141	.111
9.25	1.59	.12	.130	.108
9.50	1.58	.11	.120	.105
9.75	1.57	.10	.109	.103
10.00	1.56	.09	.098	.100
10.25	1.55	.08	.087	.098
10.50	1.55	.08	.087	.095

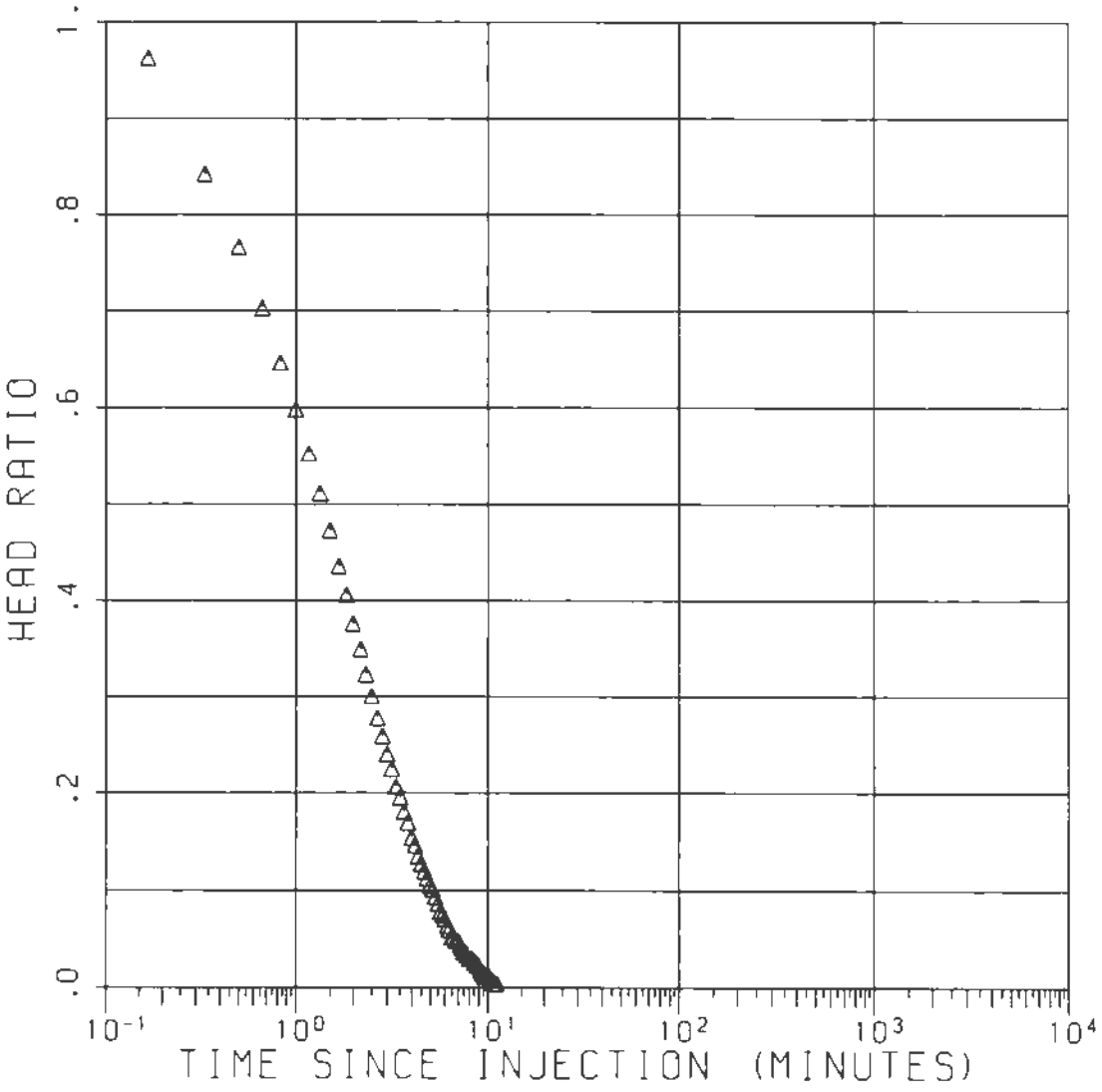
10.75	1.54	.07	.076	.093
11.00	1.53	.06	.065	.091
11.25	1.52	.05	.054	.089
11.50	1.52	.05	.054	.087
11.75	1.51	.04	.043	.085
12.00	1.50	.03	.033	.083
12.25	1.50	.03	.033	.082
12.50	1.50	.03	.033	.080
12.75	1.50	.03	.033	.078
13.00	1.50	.03	.033	.077
13.25	1.50	.03	.033	.075
13.50	1.50	.03	.033	.074
13.75	1.50	.03	.033	.073
14.00	1.50	.03	.033	.071
14.25	1.50	.03	.033	.070
14.50	1.50	.03	.033	.069
14.75	1.50	.03	.033	.068
15.00	1.49	.02	.022	.067
15.25	1.49	.02	.022	.066
15.50	1.49	.02	.022	.065
15.75	1.48	.01	.011	.063
16.00	1.48	.01	.011	.063
16.25	1.48	.01	.011	.062
16.50	1.47	.00	.000	.061
16.75	1.47	.00	.000	.060
17.00	1.47	.00	.000	.059

WELL # DG-4

WELL DIAMETER= 8.25 INCHES
CASING DIAMETER= 2.00 INCHES
VOLUME OF WATER REMOVED OR ADDED TO WELL= .28 GALLONS
LENGTH OF AQUIFER TESTED= 12.00 FEET
VALUE OF H0= 2.16 FEET
STATIC WATER LEVEL= 3.01 FEET

SLUG TEST DATA:

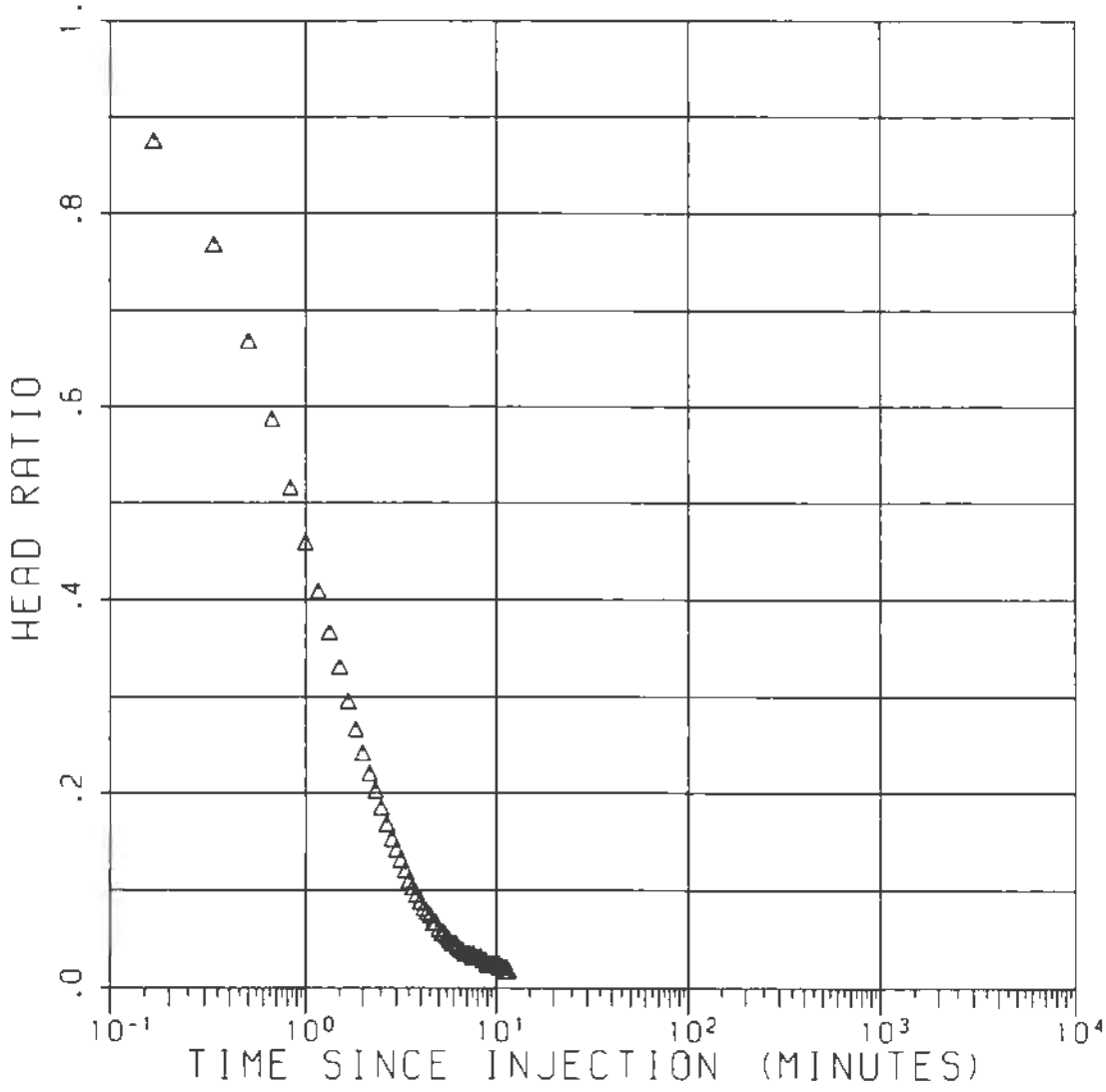
TIME SINCE TEST BEGAN (MINUTES)	WATER LEVEL (FEET)	DRAWDOWN (FEET)	HEAD RATIO	RECIPROCAL TIME (1/MINUTES)
.25	4.72	1.71	.792	4.000
.50	4.35	1.34	.620	2.000
.75	4.07	1.06	.491	1.333
1.00	3.85	.84	.389	1.000
1.25	3.67	.66	.306	.800
1.50	3.54	.53	.245	.667
1.75	3.44	.43	.199	.571
2.00	3.35	.34	.157	.500
2.25	3.28	.27	.125	.444
2.50	3.23	.22	.102	.400
2.75	3.19	.18	.083	.364
3.00	3.17	.16	.074	.333
3.25	3.14	.13	.060	.308
3.50	3.12	.11	.051	.286
3.75	3.11	.10	.046	.267
4.00	3.09	.08	.037	.250
4.25	3.08	.07	.032	.235
4.50	3.07	.06	.028	.222
4.75	3.06	.05	.023	.211
5.00	3.05	.04	.019	.200
5.25	3.04	.03	.014	.190
5.50	3.04	.03	.014	.182
5.75	3.03	.02	.009	.174
6.00	3.03	.02	.009	.167
6.25	3.03	.02	.009	.160
6.50	3.03	.02	.009	.154
6.75	3.02	.01	.005	.148
7.00	3.02	.01	.005	.143
7.25	3.02	.01	.005	.138
7.50	3.02	.01	.005	.133
7.75	3.02	.01	.005	.129
8.00	3.02	.01	.005	.125
8.25	3.01	.00	.000	.121



SYRO STEEL

SLUG TEST OF WELL MW-1

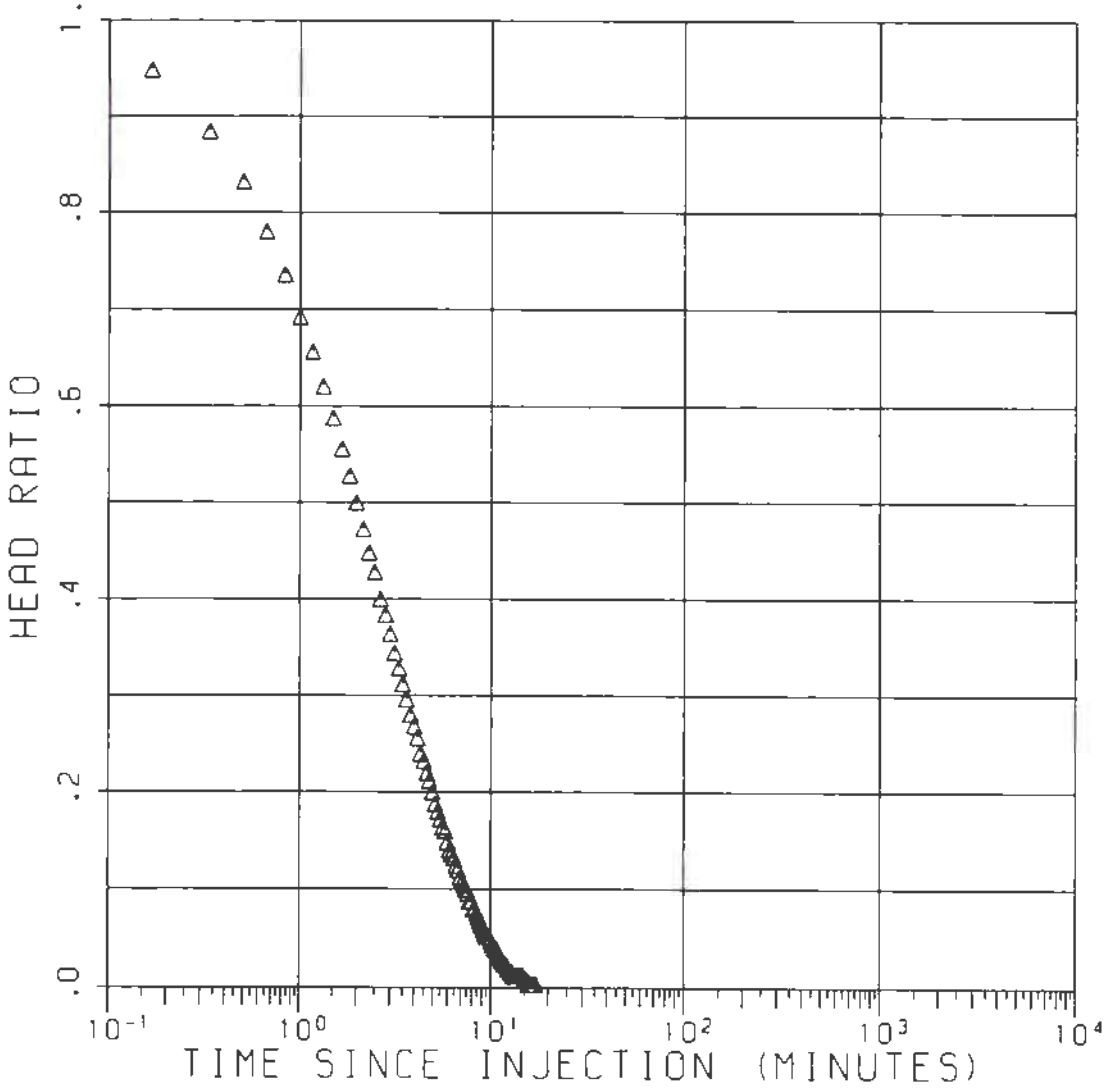
HEAD RATIO VS LOG TIME



SYRD STEEL

SLUG TEST OF WELL MW-2

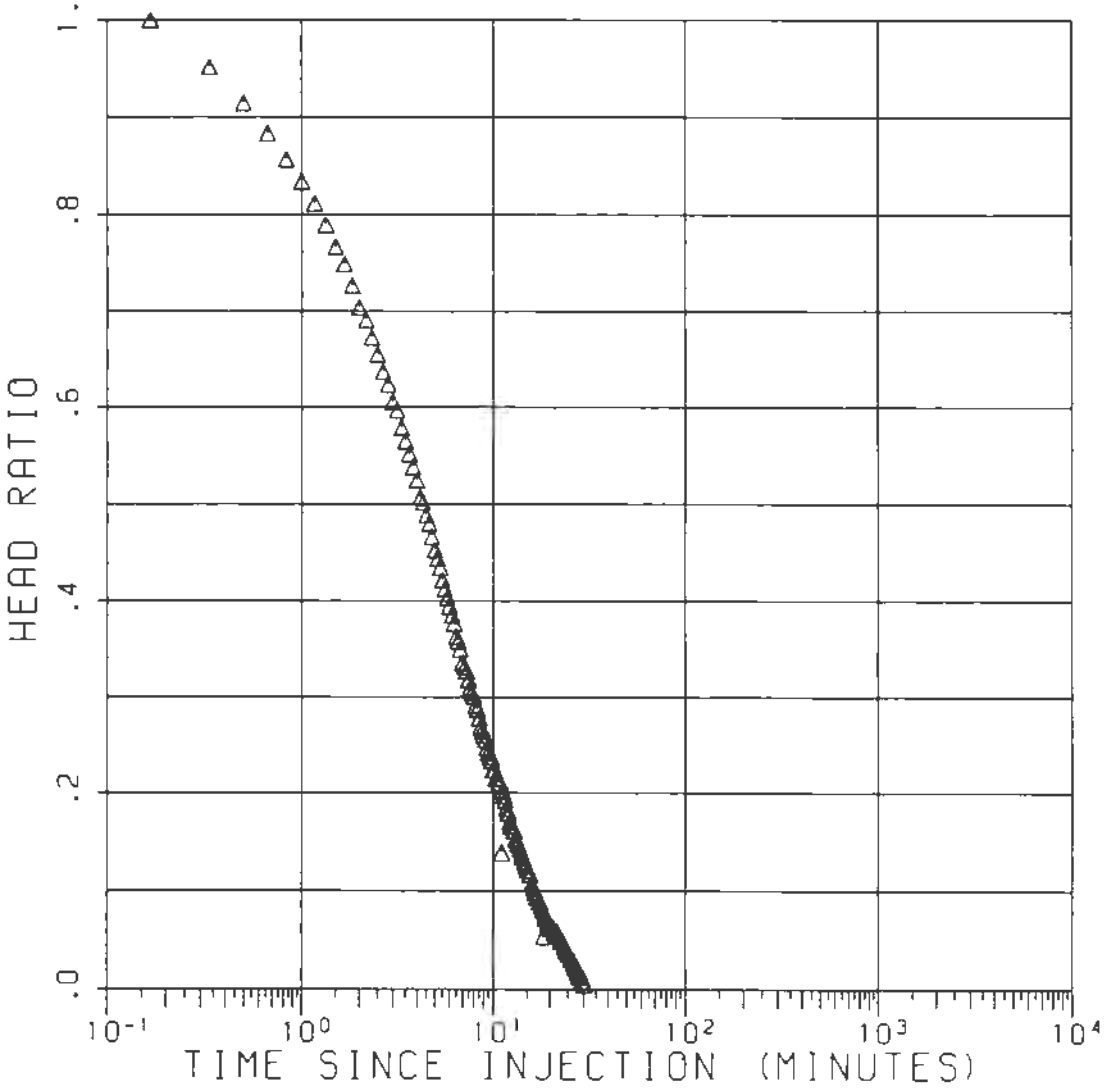
HEAD RATIO VS LOG TIME



SLUG TEST OF WELL MW-3

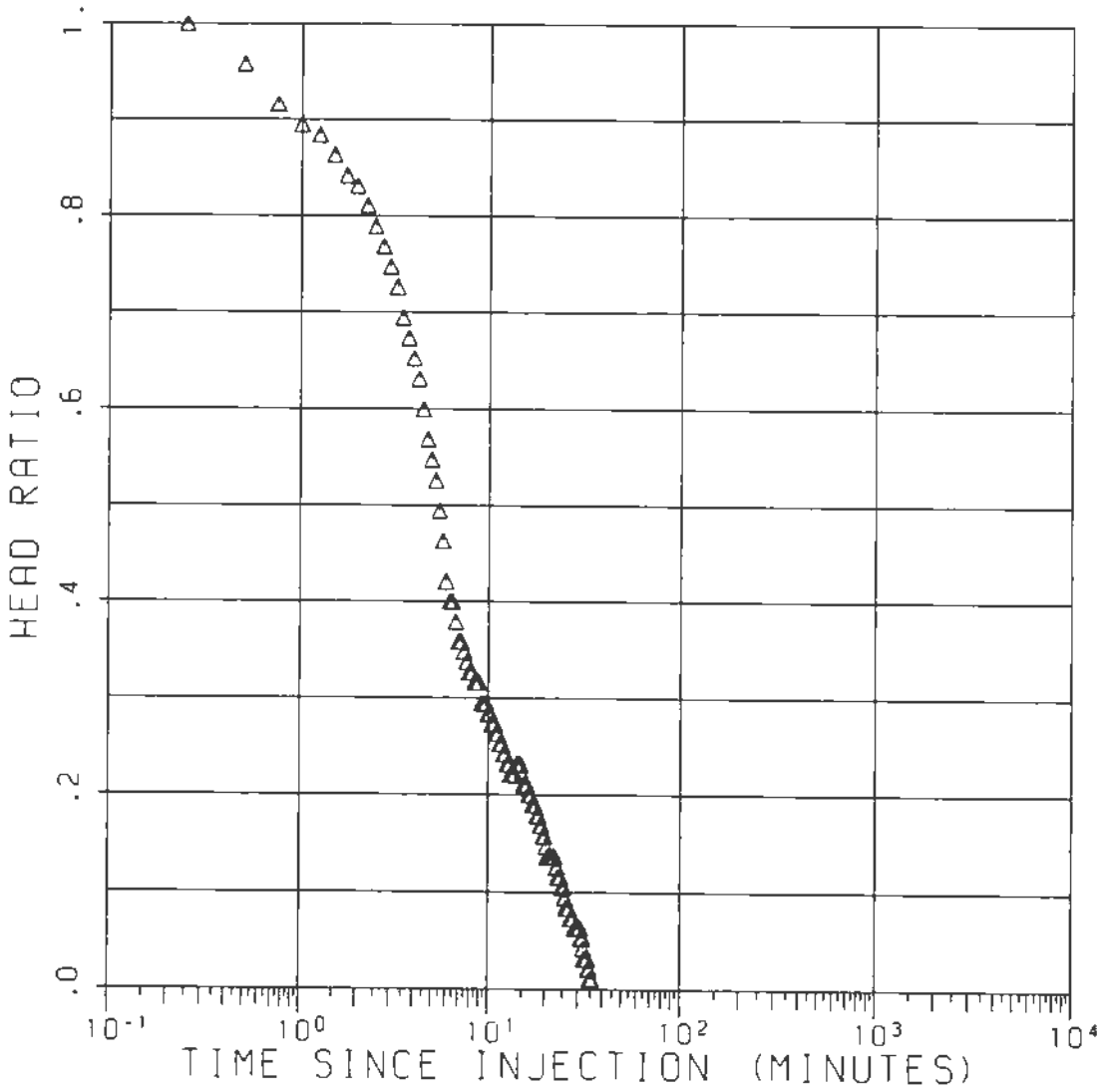
HEAD RATIO VS LOG TIME

SYRO STEEL



SYRO STEEL

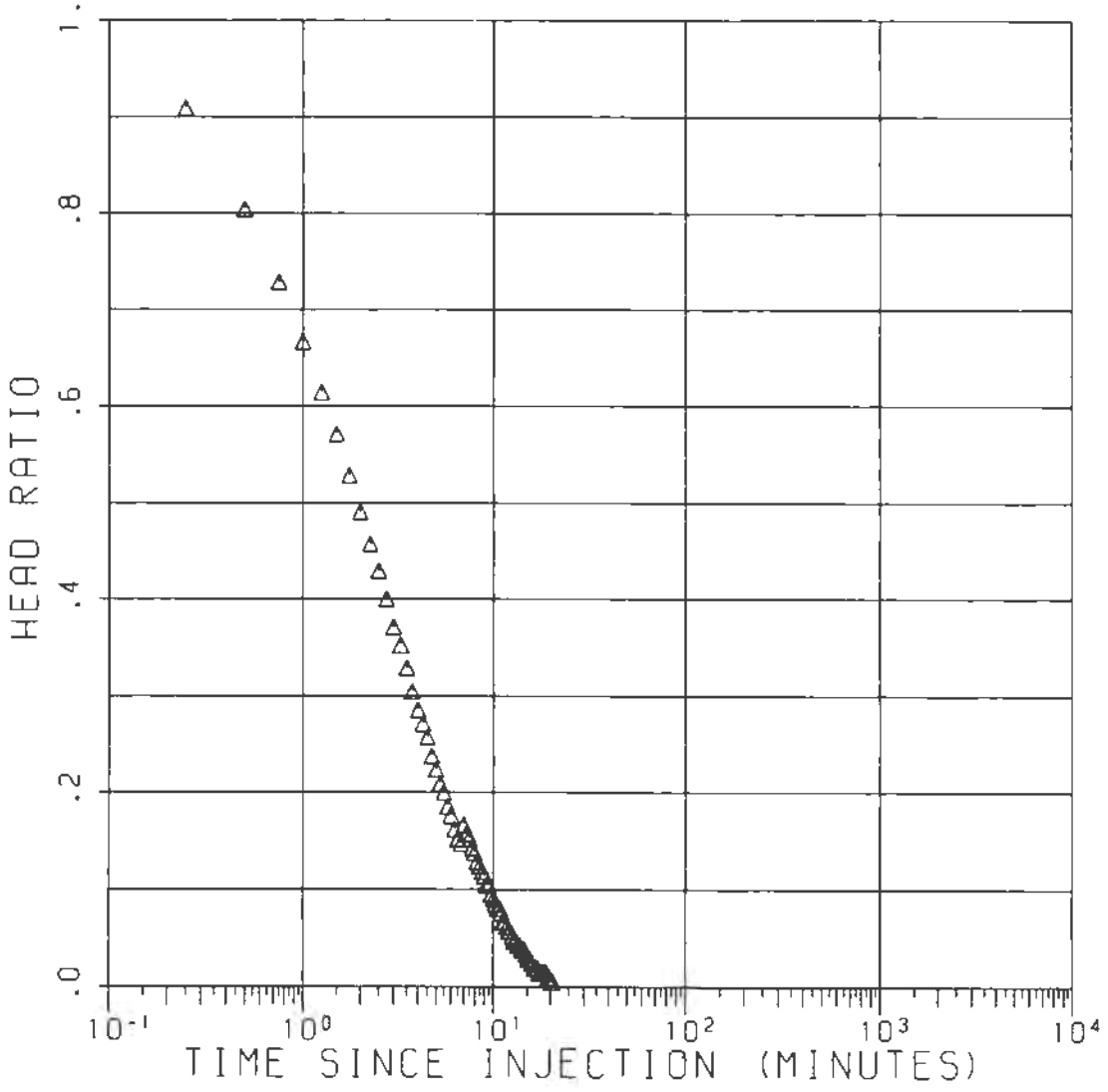
SLUG TEST OF WELL MW-4
HEAD RATIO VS LOG TIME



SYRO STEEL

SLUG TEST OF WELL MW-5

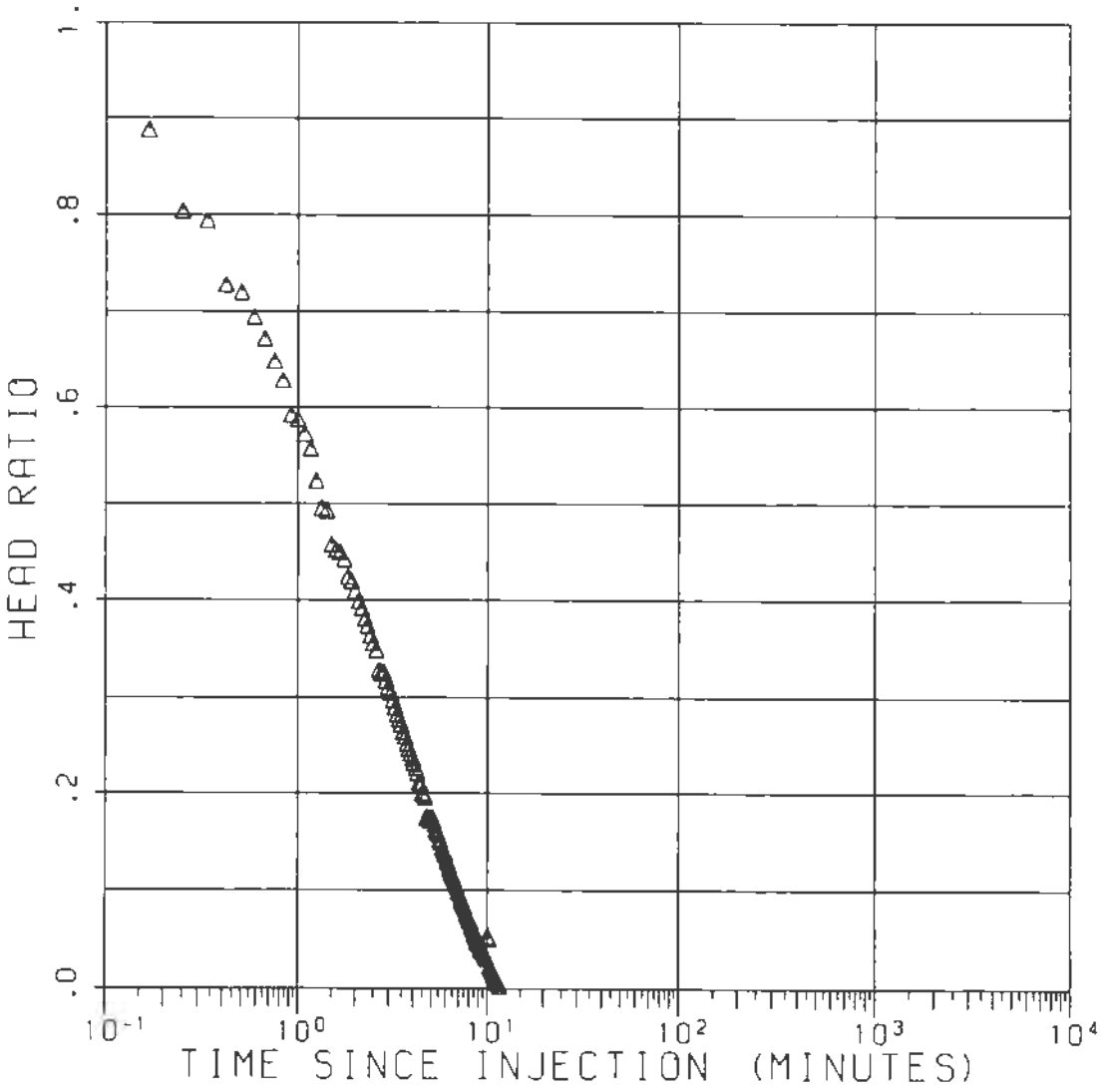
HEAD RATIO VS LOG TIME



SYRO STEEL

SLUG TEST OF WELL MW-6

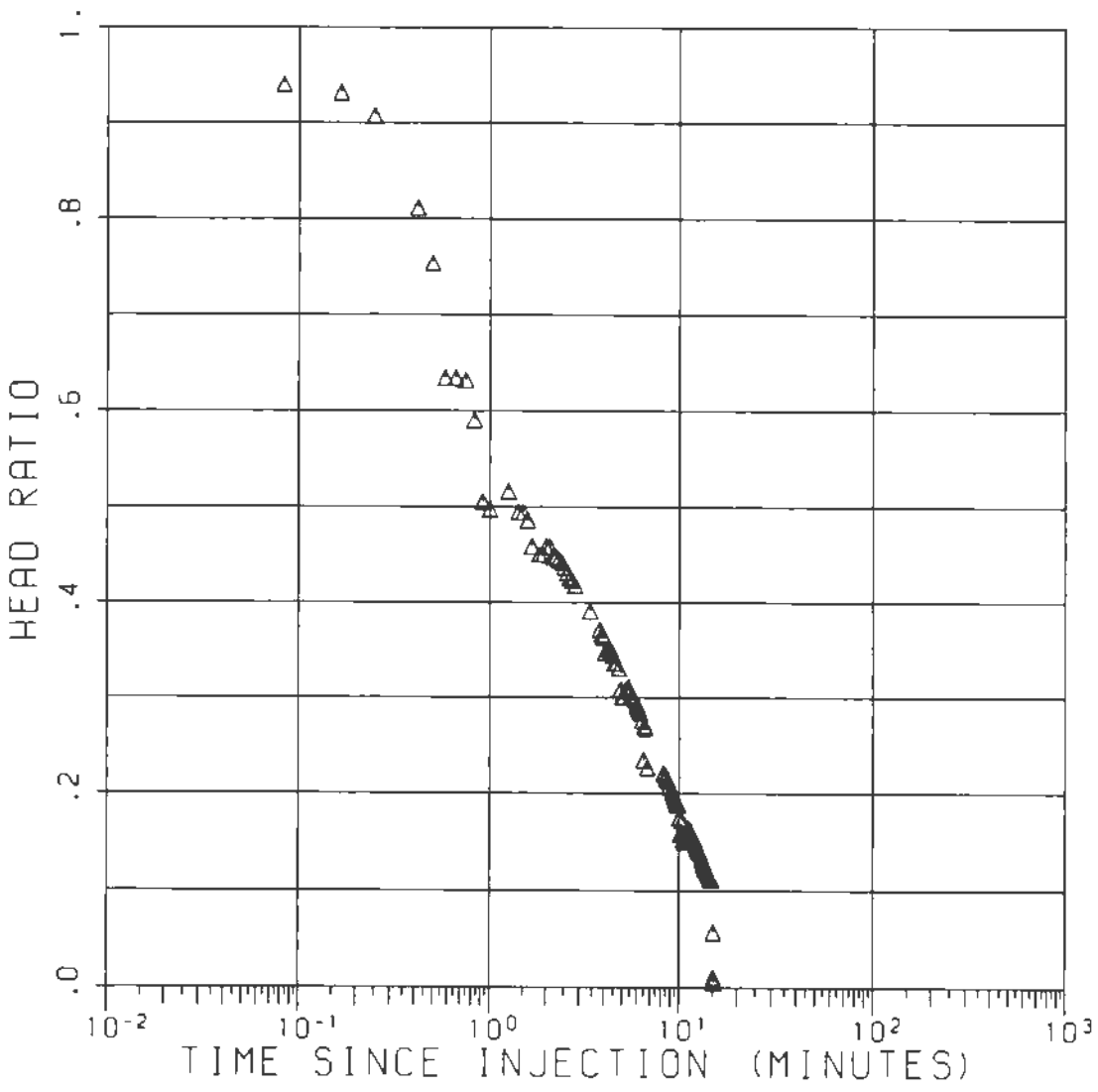
HEAD RATIO VS LOG TIME



SYRO STEEL

SLUG TEST OF WELL DH-41

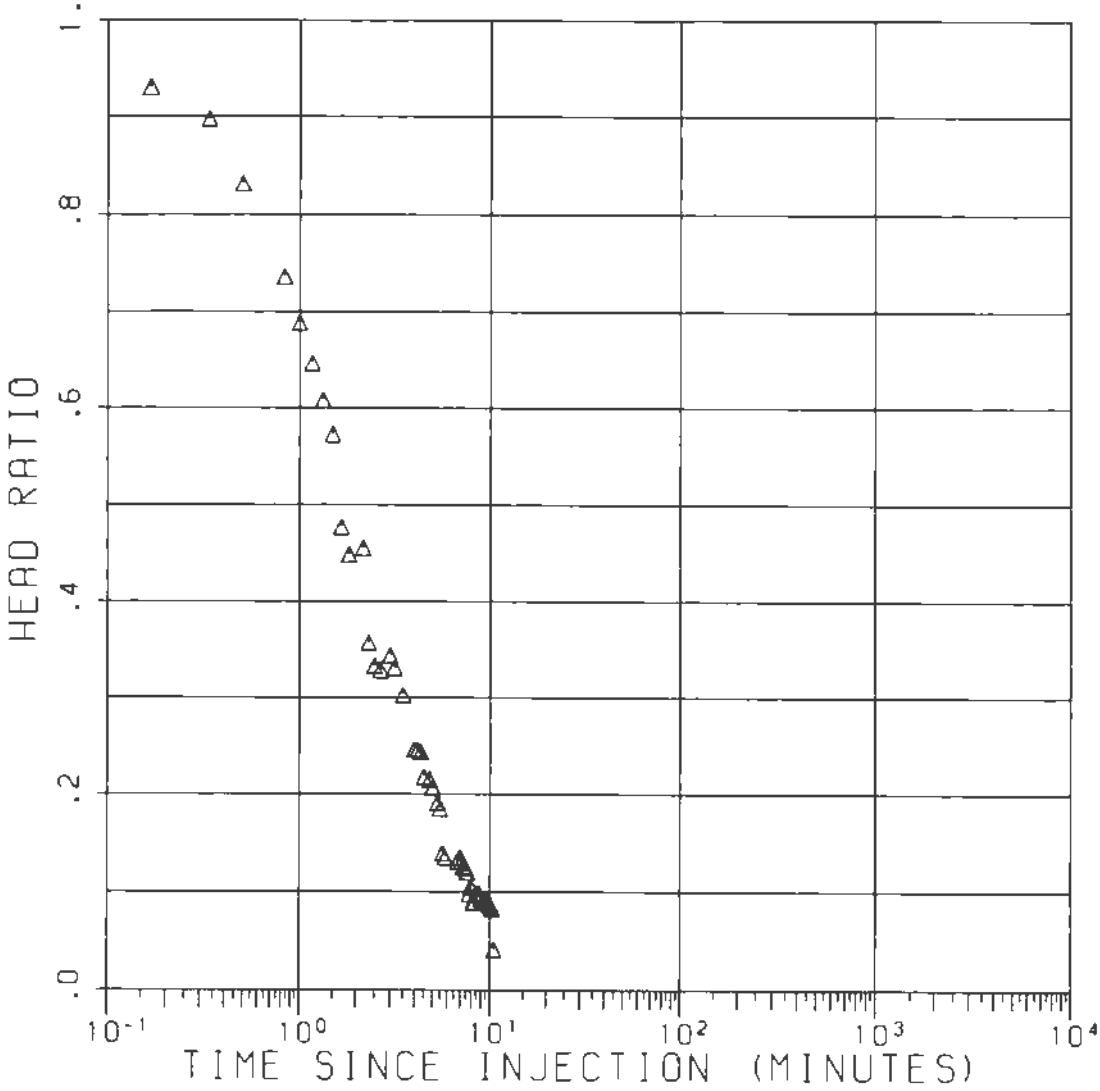
HEAD RATIO VS LOG TIME



SYRO STEEL

SLUG TEST OF WELL DH-42

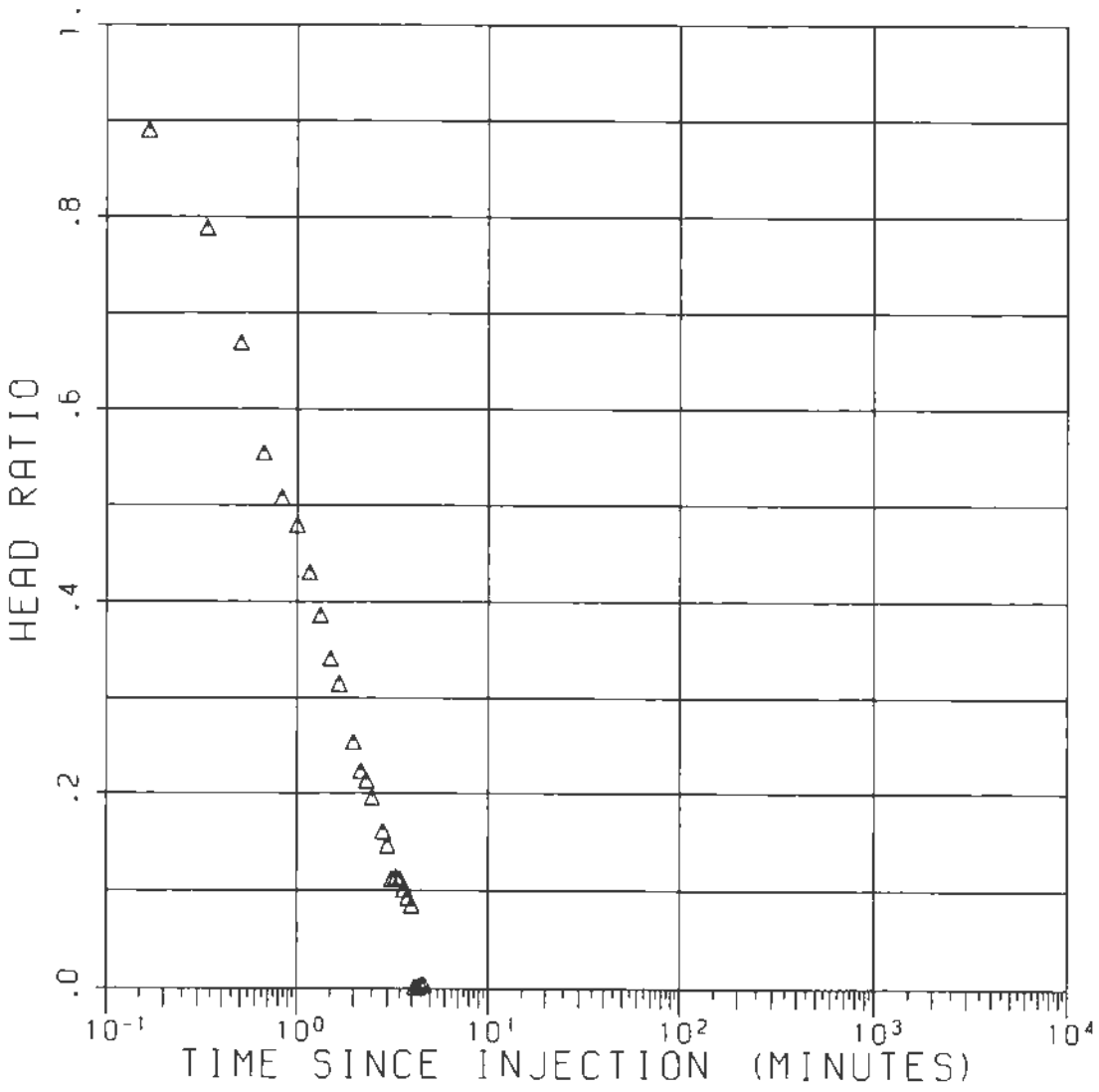
HEAD RATIO VS LOG TIME



SLUG TEST OF WELL DH-43

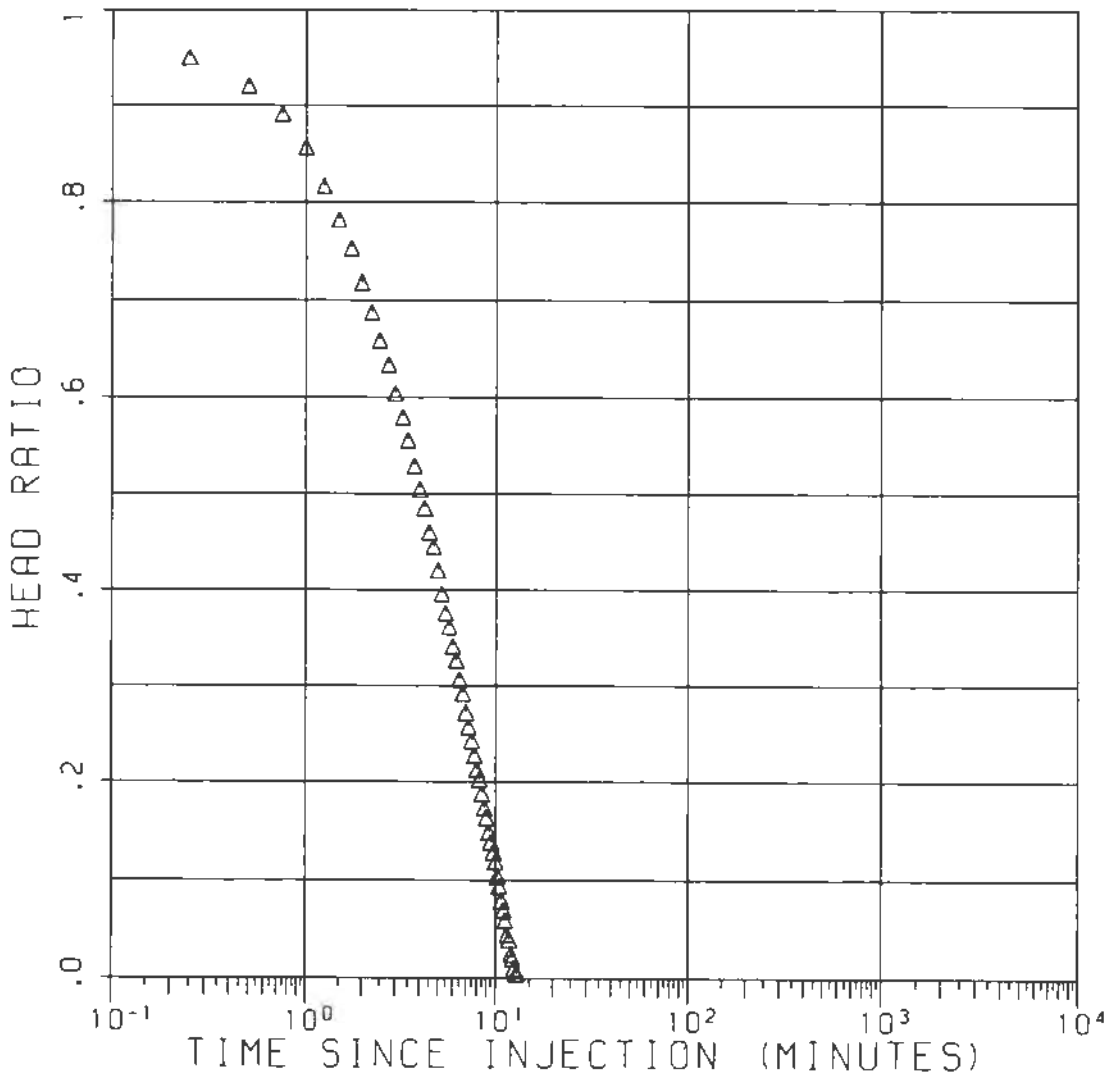
HEAD RATIO VS LOG TIME

SYRO STEEL



SYRO STEEL

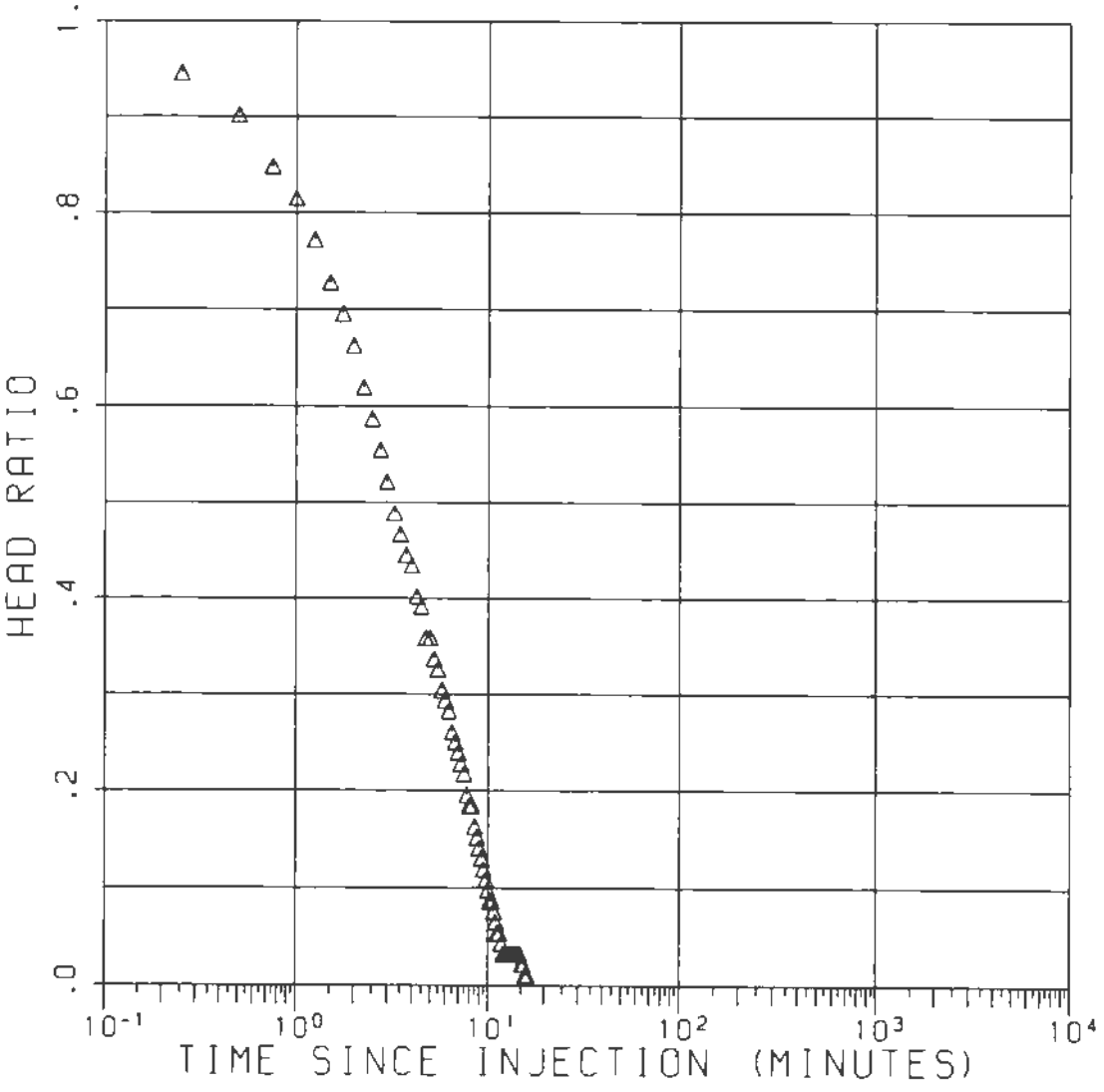
SLUG TEST OF WELL DH-45
HEAD RATIO VS LOG TIME



SYRO STEEL

SLUG TEST OF SYRO WELL

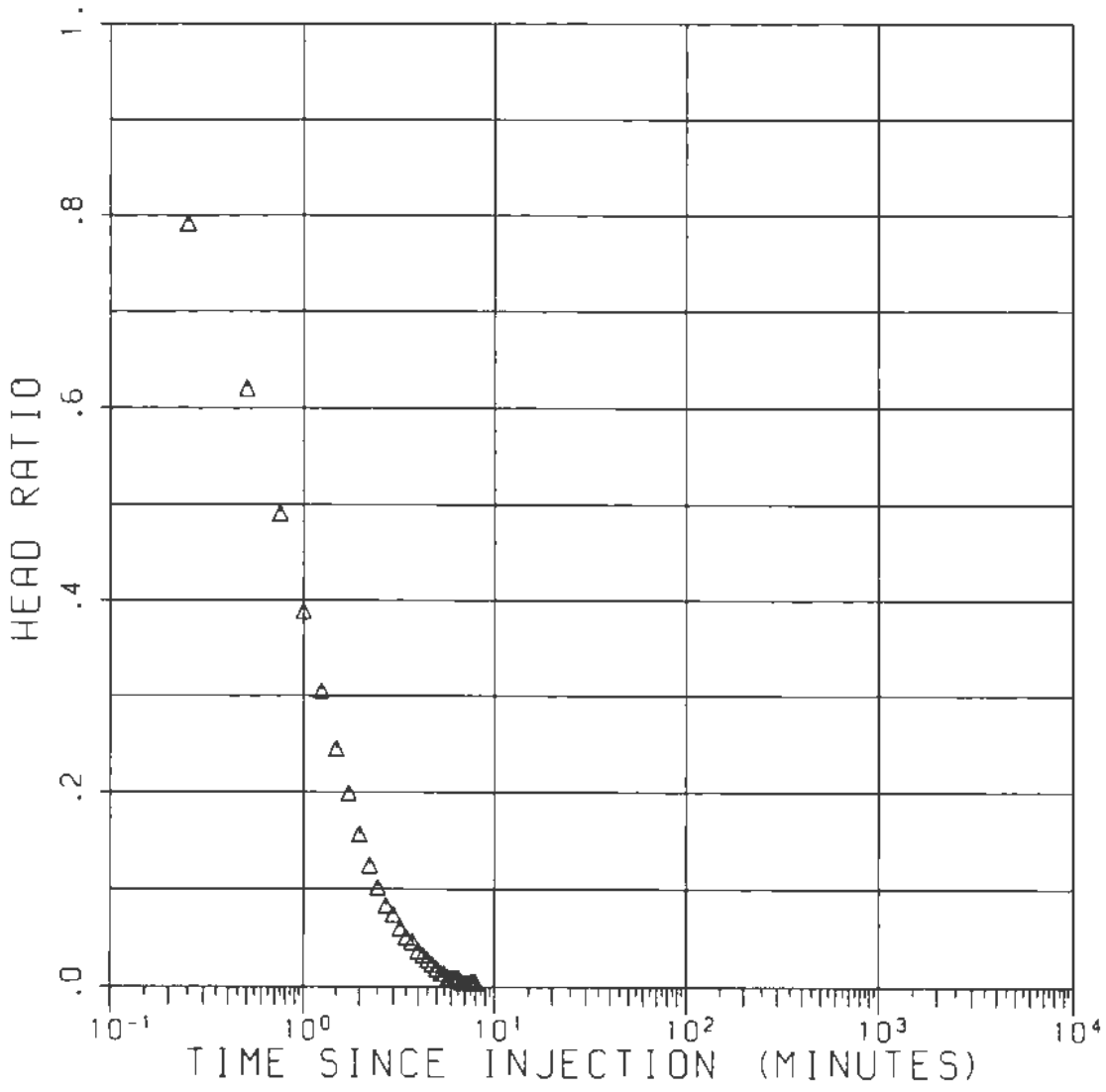
HEAD RATIO VS LOG TIME



SYRO STEEL

SLUG TEST OF UG-WELL

HEAD RATIO VS LOG TIME



SYRD STEEL

SLUG TEST OF WELL DG-4

HEAD RATIO VS LOG TIME

WELL INVENTORY

SYRO STEEL COMPANY
RESULTS OF WELL INVENTORY

MAP ID(1)	Location	Owner and/or Name	Aquifer (2)	WELL LOC(3)	Well Diameter (inches)	Well Depth (feet)	Depth to Water Below Land Surface (feet)	Use(4)	Comments
BETWEEN 1000' AND 3000' RADIUS OF RCRA SURFACE IMPOUNDMENT (CONT'D):									
13	T2N,R1W,SEC 7	Tingey, W.W. and S.C.	Confined?	L 2180				S	
16	T2N,R1W,SEC 7	Tingey, W.W. and S.C.	Confined?	U 2150				I	
18	T2N,R1W,SEC 7a	Sparks, Lowell L.	Confined	U 1620		305		I,D	
22	T2N,R1W,SEC 7	Thompson, F.A. & B.M.	Confined?	U 1620				I,S,D	
25	T2N,R1W,SEC 7	Leavitt, D. Noble	Confined?	U 1600				I,S	
26	T2N,R1W,SEC 7	Molley, Lorin C.	Confined?	U 2480				I,S	
27	T2N,R1W,SEC 7	Leavitt, D. Noble	Confined	U 1500		80		I,S	
28	T2N,R1W,SEC 7	Molley, Lorin C.	Confined?	U 1580				I,S	
29	T2N,R1W,SEC 7	Molley, Lorin C.	Confined	U 2450		150		I,S	
30	T2N,R1W,SEC 7	Molley, Lorin C.	Unconfined	U 2250		40		S	
33	T2N,R1W,SEC 18	Molley, Lorin C.	Confined?	U 2450				S	
49	T2N,R1W,SEC 18	Peterson, G.R.	Confined	U 2130		125		I,D,C	
53	T2N,R1W,SEC 18	Peterson, M.B.W.	Confined?	U 2510				I,D,C	
54	T2N,R1W,SEC 18	Molley, Lorin C.	Unconfined	U 1820		32		I,S	
55	T2N,R1W,SEC 18	Peterson, M.B.W.	Confined?	U 1980				I,S	
58	T2N,R1W,SEC 18	Molley, Lorin C.	Confined?	U 2510				I,S	
59	T2N,R1W,SEC 18	Petit, Arthur H.	Confined?	U 2510				I	
63	T2N,R1W,SEC 18	White, Clyde C.	Confined	U 1780		90		I	
65	T2N,R1W,SEC 18	Carlson, Ernest Grant	Confined	U 1550		235		S	
66	T2N,R1W,SEC 18	Williams, T.Q. & E.B.	Confined	U 1860		700		S	
67	T2N,R1W,SEC 18	Call, David (Jr.)	Confined	U 1820		140		S	
68	T2N,R1W,SEC 18	Harrison, L. and C.F.	Confined	U 2600		150		S	
69	T2N,R1W,SEC 18	Harrison, L. and C.F.	Unconfined	U 2450		30		S	
72	T2N,R1W,SEC 18	Williams, T.Q. & E.B.	Confined	U 2240		700		S	
70	T2N,R1W,SEC 18	Carlson, Ernest Grant	Confined?	U 1670				I,S	
64	T2N,R1W,SEC 18	Carlson, Ernest Grant	Confined	U 1280		190		I,S	
73	T2N,R1W,SEC 12	Center, Harold H. & A.	Confined?	L 1580				S	
83	T2N,R1W,SEC 13	Toosey, Jesse C.	Confined	L 1030	2	191	+20	I,D	
61	T2N,R1W,SEC 13	Gunnuscio, F.N. & K.	Confined?	L 1160				I,S,D	

(1) Wells are located on Figure 1 using this arbitrary numbering system.
(2) Aquifers are approximated by well depths, water levels, artesian flows, and/or lithologic descriptions from well logs.
(3) Location and distance (in feet) of well with respect to Syro RCRA facility:
- U Upgradient
- D Downgradient
- L Located laterally to the side of the RCRA facility

(4) Well use:
- D Domestic
- I Irrigation
- S Stockwater
- C Cooling
- T Test well

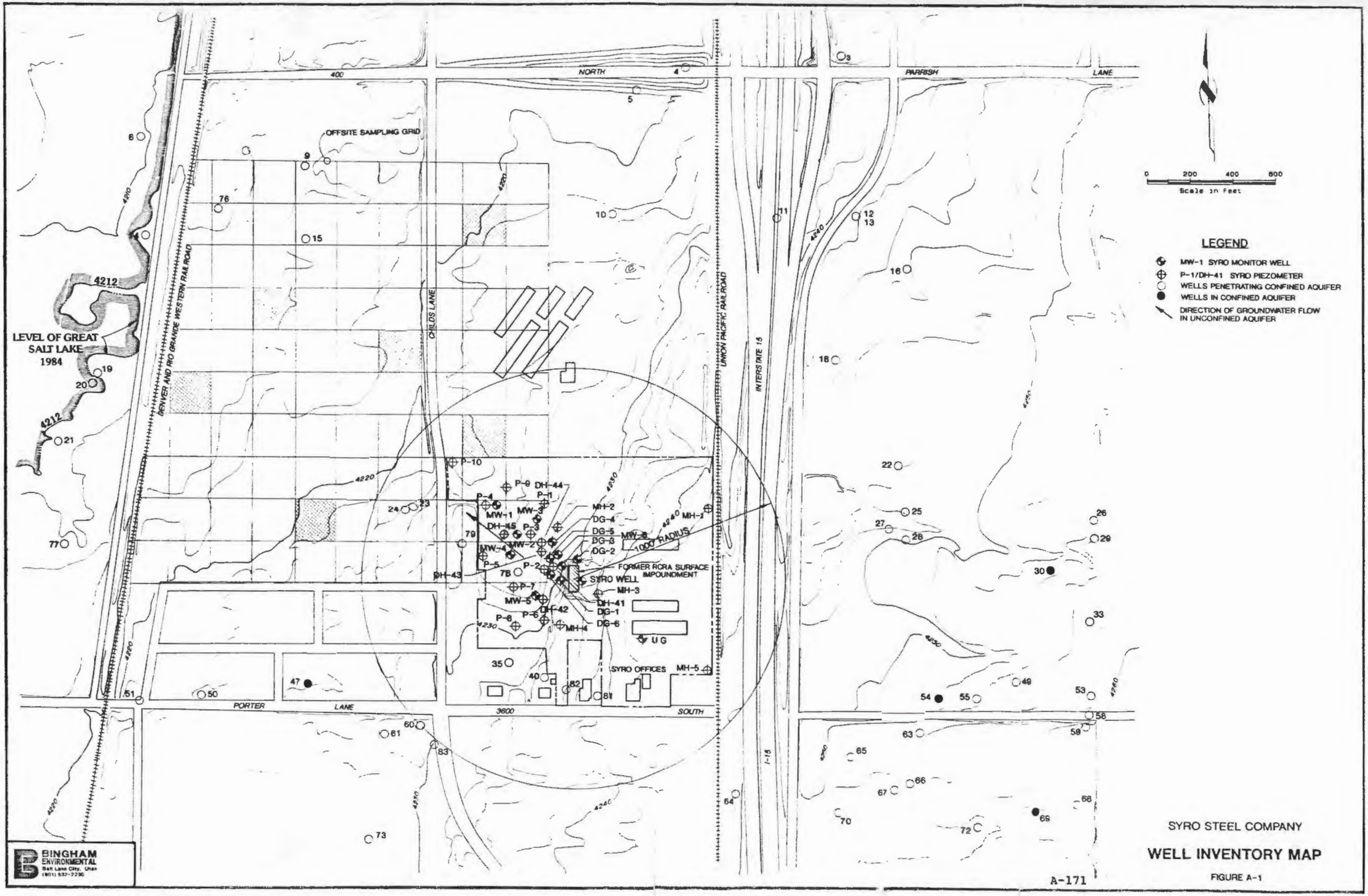
SYRO STEEL COMPANY
RESULTS OF WELL INVENTORY

MAP ID(1)	Location	Owner and/or Name	Aquifer (2)	WELL LOC(3)	Well Diameter (inches)	Well Depth (feet)	Depth to Water Below Land Surface (feet)	Use(4)	Comments
WITHIN 1000' RADIUS OF RCRA SURFACE IMPOUNDMENT:									
23	T2N,R1W,SEC 12	Child, Brandt A.	Confined	D 830	2	150		I,S,D	Not in use
24	T2N,R1W,SEC 12	Child, Brandt A.	Confined?	D 850				I,S,D	In use, stockwater only
79	T2N,R1W,SEC 12	Child, Brandt A.	Confined	D 650	4	210	+20	I,S,D	Appears to be abandoned
78	T2N,R1W,SEC 12	Ricks, Ben E.	Confined	D 270	6	393	+15	D	In use, stockwater only
35	T2N,R1W,SEC 13	Smith, Jeff	Confined	L 500	6	393		I	
40	T2N,R1W,SEC 13	Porter, O	Confined?	L 490				I	
81	T2N,R1W,SEC 13	Napoli, Leonard	Confined	U 570	3	299	+34	I,S,D	In use, irrigation only
60	T2N,R1W,SEC 13	Bibson, Kieth R.	Confined?	L 1000				I,D	
82	T2N,R1W,SEC 13	Napoli, Leonard	Confined	L 530	2	264	+33	I,S,D	In use, irrigation only
BETWEEN 1000' AND 3000' RADIUS OF RCRA SURFACE IMPOUNDMENT:									
47	T2N,R1W,SEC 13	Barrus, Roger E.	Unconfined	D 1350	8	12	1.8	I	Not in use, pH = 6.9
50	T2N,R1W,SEC 13	Hatch, E. H.	Confined	D 1850		365		I,S	
51	T2N,R1W,SEC 13	Hatch, E. H.	Confined	D 2130		265		I,S,D	
77	T2N,R1W,SEC 12	Tolman, R. C.	Confined	D 2410	8	545	+50	I,S,D	
21	T2N,R1W,SEC 12	Tolman, R. C.	Confined	D 2530	8	500		I,S,D	
20	T2N,R1W,SEC 12	Diehl, Warren C.	Confined	D 2470	2	78		I,S,D	
19	T2N,R1W,SEC 12	Argyle, L.M. and C.	Confined	D 2480	2	75		S	
14	T2N,R1W,SEC 12	Parrish, J.S. and J.W.	Confined?	D 2630				S	
76	T2N,R1W,SEC 12	Rampa, Mike	Confined	D 2450	2	263	+25	?	
6	T2N,R1W,SEC 12	Tingey, W.W. and S.C.	Confined?	D 2930				S	
15	T2N,R1W,SEC 12	Liston, D.C. and M.C.	Confined?	D 2050	2			I,S	
8	T2N,R1W,SEC 12	Higgins, E. Arthur	Confined	D 2550	8	502		I,S,D	
9	T2N,R1W,SEC 12	Richmond, Idell	Confined	D 2340	2	263		I,D	
10	T2N,R1W,SEC 12	Cheney, Gilbert W.	Confined?	L 1740				S	
5	T2N,R1W,SEC 12	Burton, C. Taylor	Confined	L 2340	16	700		I,D	
4	T2N,R1W,SEC 12	Burton, C. Taylor	Confined?	L 2600				S	
3	T2N,R1W,SEC 12	Pingree, J. Fred	Confined?	L 2790		415		I,D	
11	T2N,R1W,SEC 7	Arrillaga, Joseph	Confined	L 1960		258		S	Abandoned
12	T2N,R1W,SEC 7	Arrillaga, Joseph	Confined?	L 2180				I,S	

(1) Wells are located on Figure 1 using this arbitrary numbering system.
(2) Aquifers are approximated by well depths, water levels, artesian flows, and/or lithologic descriptions from well logs.
(3) Location and distance (in feet) of well with respect to Syro RCRA facility:
- U Upgradient
- D Downgradient
- L Located laterally to the side of the RCRA facility

(4) Well use:
- D Domestic
- I Irrigation
- S Stockwater
- C Cooling
- T Test well

Will take Samples from 23 or 24?


400
NORTH
PARRISH
LANE
OFFSITE SAMPLING GRID
DENVER AND RIO GRANDE WESTERN RAILROAD
CHILDS LANE
UNION PACIFIC RAILROAD
INTERSTATE 15
4210
4212
4220
4230
4240
LEVEL OF GREAT SALT LAKE 1984
1000' RADIUS
FORMER RCRA SURFACE IMPOUNDMENT
SYRO WELL
SYRO OFFICES
U G
PORTER
LANE
3600
SOUTH
I-15
P-10
P-9
DH-44
P-1
P-4
MW-1
MW-3
DH-45
P-3
MW-4
MW-2
P-5
P-2
DH-43
P-7
MW-5
DH-42
P-6
P-8
MH-2
DG-4
DG-5
DG-8
DG-2
MW-8
MH-1
MH-3
DH-41
DG-1
DG-6
MH-4
MH-5
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63
64
65
66
67
68
69
70
72
73
77
78
79
81
82
83
0
200
400
800
Scale in Feet
LEGEND
MW-1 SYRO MONITOR WELL
P-1/DH-41 SYRO PIEZOMETER
WELLS PENETRATING CONFINED AQUIFER
WELLS IN CONFINED AQUIFER
DIRECTION OF GROUNDWATER FLOW IN UNCONFINED AQUIFER
BINGHAM ENVIRONMENTAL
Salt Lake City, Utah
(801) 532-2230
SYRO STEEL COMPANY
WELL INVENTORY MAP
FIGURE A-1
A-171

WATER LEVEL MEASUREMENTS

SUMMARY OF WATER LEVEL MEASUREMENTS
SYRO STEEL COMPANY

WELL ID #	ELEVATION GROUND SURFACE (feet)	ELEV. TOP OF PVC W/O CAP (feet)	DEPTH TO WATER FROM TOP OF PVC (feet)	ELEVATION GROUND-WATER (feet)	DEPTH TO WATER FROM TOP OF PVC (feet)	ELEVATION GROUND-WATER (feet)
			July 30, 1991		December 2, 1991	
MW-1	4222.5	4224.46	NA	NA	2.24	4222.22
MW-2	4226.0	4227.56	NA	NA	2.37	4225.19
MW-3	4225.2	4227.01	NA	NA	2.50	4224.51
MW-4	4224.4	4226.30	NA	NA	1.99	4224.31
MW-5	4228.0	4229.82	NA	NA	2.07	4227.75
MW-6	4228.1	4229.57	NA	NA	2.96	4226.61
UG-Well	4243.0	4243.00	10.26	4232.74	8.48	4234.52
SYRO Well	4238.4	4239.12	8.56	4230.56	NA	NA
DG-1	4230.4	NA	NA	NA	NA	NA
DG-2	4230.1	4230.82	4.34	4226.48	2.84	4227.98
DG-3	4228.8	4229.61	4.25	4225.36	2.85	4226.76
DG-4	4227.5	4228.02	3.88	4224.14	1.52	4226.50
DG-5	4227.5	4227.98	2.55	4225.43	1.45	4226.53
DG-6	4228.5	4229.09	2.70	4226.39	2.60	4226.49
DH-41	4229.3	4231.35	4.97	4226.38	3.98	4227.37
DH-42	4228.8	4230.90	3.88	4227.02	2.85	4228.05
DH-43	4226.3	4228.15	3.99	4224.16	2.17	4225.98
DH-44	4226.4	4228.07	ARTESIAN	NA	ARTESIAN	NA
DH-45	4224.7	4226.30	5.25	4221.05	2.70	4223.60
P-1	4225.8	4227.16	4.76	4222.40	3.32	4223.84
P-2	4226.8	4228.88	3.37	4225.51	2.44	4226.44
P-3	4226.2	4227.23	4.85	4222.38	2.44	4224.79
P-4	4222.5	4224.30	4.15	4220.15	2.13	4222.17
P-5	4224.5	4226.20	5.29	4220.91	2.76	4223.44
P-6	4230.1	4231.28	3.57	4227.71	2.02	4229.26
P-7	4225.3	4227.54	4.57	4222.97	2.46	4225.08
P-8	NA	NA	NA	NA	NA	NA
P-9	NA	NA	NA	NA	NA	NA
P-10	4221.7	4223.16	3.51	4219.65	2.39	4220.77
MH-1	4242.1	4243.61	11.94	4231.67	NA	NA
MH-2	4226.9	4230.29	6.65	4223.64	3.96	4226.33
MH-3	4240.2	4243.04	11.26	4231.78	9.62	4233.42
MH-4	4234.8	NA	NA	NA	NA	NA
MH-5	4243.9	4245.91	9.12	4236.79	NA	NA

NA - Not available or applicable.

MLB 4/17/92

SUMMARY OF WATER LEVEL MEASUREMENTS
SYRO STEEL COMPANY

WELL ID #	ELEVATION GROUND SURFACE (feet)	ELEV. TOP OF PVC W/O CAP (feet)	DEPTH TO WATER FROM TOP OF PVC (feet)	ELEVATION GROUND-WATER (feet)	DEPTH TO WATER FROM TOP OF PVC (feet)	ELEVATION GROUND-WATER (feet)
			February 24, 1992		August 25, 1992	
MW-1	4222.5	4224.46	2.15	4222.31	5.51	4218.95
MW-2	4226.0	4227.56	2.16	4225.40	5.98	4221.58
MW-3	4225.2	4227.01	2.38	4224.63	5.97	4221.04
MW-4	4224.4	4226.30	1.96	4224.34	5.52	4220.78
MW-5	4228.0	4229.82	1.99	4227.83	3.59	4226.23
MW-6	4228.1	4229.57	2.63	4226.94	6.45	4223.12
UG-Well	4243.0	4243.00	7.20	4235.80	11.19	4231.81
SYRO Well	4238.4	4239.12	5.40	4233.72	8.00	4231.12
DG-1	4230.4	NA	NA	NA	NA	NA
DG-2	4230.1	4230.82	1.49	4229.33	6.78	4224.04
DG-3	4228.8	4229.61	2.49	4227.12	6.16	4223.45
DG-4	4227.5	4228.02	1.09	4226.93	6.41	4221.61
DG-5	4227.5	4227.98	1.09	4226.89	4.72	4223.26
DG-6	4228.5	4229.09	1.74	4227.35	4.51	4224.58
DH-41	4229.3	4231.35	3.48	4227.87	6.50	4224.85
DH-42	4228.8	4230.90	2.72	4228.18	4.16	4226.74
DH-43	4226.3	4228.15	1.83	4226.32	5.65	4222.50
DH-44	4226.4	4228.07	ARTESIAN	NA	1.57	4226.50
DH-45	4224.7	4226.30	2.60	4223.70	6.83	4219.47
P-1	4225.8	4227.16	3.28	4223.88	6.13	4221.03
P-2	4226.8	4228.88	2.31	4226.57	4.78	4224.10
P-3	4226.2	4227.23	2.43	4224.80	6.19	4221.04
P-4	4222.5	4224.30	2.04	4222.26	5.43	4218.87
P-5	4224.5	4226.20	2.25	4223.95	6.39	4219.81
P-6	4230.1	4231.28	1.93	4229.35	3.88	4227.40
P-7	4225.3	4227.54	2.27	4225.27	5.51	4222.03
P-8	NA	NA	NA	NA	NA	NA
P-9	NA	NA	NA	NA	NA	NA
P-10	4221.7	4223.16	2.11	4221.05	5.16	4218.00
MH-1	4242.1	4243.61	7.22	4236.39	12.01	4231.60
MH-2	4226.9	4230.29	3.57	4226.72	7.88	4222.41
MH-3	4240.2	4243.04	8.35	4234.69	11.98	4231.06
MH-4	4234.8	NA	NA	NA	NA	NA
MH-5	4243.9	4245.91	4.34	4241.57	10.22	4235.69

NA - Not available or applicable.

glm 8/26/92

SUMMARY OF WATER LEVEL MEASUREMENTS
SYRO, INC.

WELL ID #	ELEVATION GROUND SURFACE (feet)	ELEV. TOP OF PVC W/O CAP (feet)	DEPTH TO WATER FROM TOP OF PVC (feet)	ELEVATION GROUND-WATER (feet)	DEPTH TO WATER FROM TOP OF PVC (feet)	ELEVATION GROUND-WATER (feet)
			June 4, 1993		June 6, 1994	
MW-1	4222.5	4224.46	2.24	4222.22	3.67	4220.79
MW-2	4226.0	4227.56	2.30	4225.26	3.89	4223.67
MW-3	4225.2	4227.01	2.43	4224.58	3.81	4223.20
MW-4	4224.4	4226.30	NA	NA	3.83	4222.47
MW-5	4228.0	4229.82	2.18	4227.64	3.20	4226.62
MW-6	4228.1	4229.57	2.66	4226.91	4.19	4225.38
MW-7	4222.0	4224.58	NA	NA	3.88	4220.70
MW-8	4243.5	4245.68	NA	NA	8.18	4237.50
UG-Well	4243.0	4243.00	8.24	4234.76	9.58	4233.42
SYRO Well*	4238.4	4239.12	6.49	4232.63	NA	NA
DG-1*	4230.4	NA	NA	NA	NA	NA
DG-2*	4230.1	4230.82	1.70	4228.40	NA	NA
DG-3*	4228.8	4229.61	2.67	4226.94	NA	NA
DG-4	4227.5	4228.02	1.05	4226.97	3.12	4224.90
DG-5*	4227.5	4227.98	1.08	4226.90	NA	NA
DG-6*	4228.5	4229.09	1.67	4227.42	NA	NA
DH-41	4229.3	4231.35	3.48	4227.87	4.71	4226.64
DH-42	4228.8	4230.90	2.91	4227.99	3.71	4227.19
DH-43	4226.3	4228.15	0.20	4226.10	NA	NA
DH-44	4226.4	4228.07	ARTESIAN	NA	ARTESIAN	NA
DH-45	4224.7	4226.30	NA	NA	NA	NA
P-1	4225.8	4227.16	3.20	4223.96	3.76	4223.40
P-2	4226.8	4228.88	2.18	4226.70	2.96	4225.92
P-3	4226.2	4227.23	2.64	4224.59	NA	NA
P-4	4222.5	4224.30	2.17	4222.13	3.83	4220.47
P-5	4224.5	4226.20	3.20	4223.00	4.62	4221.58
P-6	4230.1	4231.28	1.18	4230.10	3.41	4227.87
P-7	4225.3	4227.54	3.14	4224.40	4.01	4223.53
P-8	NA	NA	NA	NA	NA	NA
P-9	NA	NA	NA	NA	NA	NA
P-10	4221.7	4223.16	2.44	4220.72	2.86	4220.30
MH-1	4242.1	4243.61	8.87	4234.74	9.51	4234.10
MH-2	4226.9	4230.29	4.04	4226.25	5.68	4224.61
MH-3	4240.2	4243.04	9.34	4233.70	10.45	4232.59
MH-4	4234.8	NA	NA	NA	NA	NA
MH-5	4243.9	4245.91	NA	NA	NA	NA

NA - Not available or applicable.

mct 6/13/94

* Well abandoned April 1994

SURVEYING

SYRO, INC.
SUMMARY OF WELL
LOCATIONS AND ELEVATIONS

DRILL HOLE ID	PROJECT COORDINATES		ELEV. GROUND SURFACE (feet)	ELEV. TOP PROTECTIVE CASING WITH LID (feet)	ELEV. TOP OF PVC W/O CAP (feet)
	Northing (feet)	Easting (feet)			
UG-Well	9626.4	50403.7	4243.0	NA	4243.00
SYRO Well*	9923.6	50163.8	4238.4	4239.36	4239.12
DG-1*	9934.9	50052.2	4230.4	NA	NA
DG-2*	10028.3	50104.6	4230.1	4230.98	4230.82
DG-3*	9993.8	50042.9	4228.8	4229.77	4229.61
DG-4	10095.8	50031.6	4227.5	4228.42	4228.02
DG-5*	10018.1	50017.0	4227.5	4228.37	4227.98
DG-6*	9971.9	50020.3	4228.5	4229.37	4229.09
MW-1	10272.7	49711.1	4222.5	NA	4224.46
MW-2	10123.8	49891.3	4226.0	NA	4227.56
MW-3	10215.1	49964.9	4225.2	NA	4227.01
MW-4	10023.3	49835.7	4224.4	NA	4226.30
MW-5	9830.2	49952.4	4228.0	NA	4229.82
MW-6	10020.8	50044.7	4228.1	NA	4229.57
MW-7	10362.5	49630.1	4222.0	4224.66	4224.58
MW-8	9469.1	50732.3	4243.5	4245.76	4245.68
P-1	10270.6	49991.9	4225.8	NA	4227.16
P-2	9979.8	49981.8	4226.8	NA	4228.88
P-3	10123.4	49901.1	4226.2	NA	4227.23
P-4	10280.4	49714.8	4222.5	NA	4224.30
P-5	10108.6	49700.4	4224.5	NA	4226.20
P-6	9743.3	49969.6	4230.1	NA	4231.28
P-7	9907.9	49833.2	4225.3	NA	4227.54
P-8*	9703.5	49842.5	NA	NA	NA
P-9*	10359.0	49797.0	NA	NA	NA
P-10	10469.3	49559.0	4221.7	NA	4223.16
MH-1	10270.3	50727.0	4242.1	NA	4243.61
MH-2	10158.7	50039.5	4226.9	NA	4230.29
MH-3	9854.4	50253.7	4240.2	NA	4243.04
MH-4*	9702.5	50023.6	4234.8	NA	NA
MH-5*	9470.8	50722.2	4243.9	NA	4245.91
DH-1	10031.9	50160.2	4236.5	NA	NA
DH-2	10027.2	50082.9	4230.0	NA	NA
DH-3	10021.1	50035.0	4227.7	NA	NA
DH-4	10023.9	49976.9	4226.4	NA	NA
DH-6	10023.1	49883.8	4224.8	NA	NA
DH-7	9929.0	50120.2	4233.5	NA	NA
DH-8	9826.5	50133.3	4234.7	NA	NA
DH-9	10147.3	50090.5	4227.8	NA	NA

NA - Not Available or Applicable

* Damaged or Abandoned

SYRO, INC.
SUMMARY OF WELL
LOCATIONS AND ELEVATIONS

DRILL HOLE ID	PROJECT COORDINATES		ELEV. GROUND SURFACE (feet)	ELEV. TOP PROTECTIVE CASING WITH LID (feet)	ELEV. TOP OF PVC W/O CAP (feet)
	Northing (feet)	Easting (feet)			
DH-10	10343.0	49998.0	4225.2	NA	NA
DH-11	10216.7	49977.8	4225.5	NA	NA
DH-12	10116.7	49978.1	4226.3	NA	NA
DH-13	9920.3	49981.1	4227.2	NA	NA
DH-14	9816.7	49970.2	4228.9	NA	NA
DH-15	9718.8	49976.1	4230.6	NA	NA
DH-16	9661.2	49965.0	4231.5	NA	NA
DH-17	10343.5	49901.8	4224.0	NA	NA
DH-18	10244.3	49890.6	4224.2	NA	NA
DH-19	10144.9	49887.4	4226.0	NA	NA
DH-20	9934.8	49877.1	4225.5	NA	NA
DH-21	9847.7	49876.8	4226.9	NA	NA
DH-22	9735.4	49871.4	4229.3	NA	NA
DH-23	10031.0	49685.9	4225.5	NA	NA
DH-24	10027.6	49779.5	4224.2	NA	NA
DH-25	9933.2	49775.5	4225.9	NA	NA
DH-26	9847.2	49773.8	4227.8	NA	NA
DH-27	10132.5	49689.3	4224.3	NA	NA
DH-28	10231.2	49683.9	4222.7	NA	NA
DH-29	10249.6	50093.8	4227.5	NA	NA
DH-30	10247.9	50037.4	4226.4	NA	NA
DH-31	10335.3	49685.4	4222.6	NA	NA
DH-32	10334.9	49593.9	4224.0	NA	NA
DH-33	10553.1	49617.1	4220.8	NA	NA
DH-34	10749.6	49556.6	4220.8	NA	NA
DH-35	10035.5	50257.5	4237.8	NA	NA
DH-36	9819.3	50268.8	4240.2	NA	NA
DH-37	9894.1	50211.9	4239.1	NA	NA
DH-38	9821.9	50053.9	4233.5	NA	NA
DH-39	10053.6	50042.9	4227.9	NA	NA
DH-40	10023.9	50059.0	4228.3	NA	NA
DH-41	9975.1	50050.9	4229.3	NA	4231.35
DH-42	9823.4	49969.8	4228.8	NA	4230.90
DH-43	10024.2	49971.7	4226.3	NA	4228.15
DH-44	10032.5	49981.6	4226.4	NA	4228.07
DH-45	10136.2	49784.8	4224.7	NA	4226.30
DH-46	10058.9	49478.6	4229.3	NA	NA

NA - Not Available or Applicable

SYRO, INC.
SUMMARY OF WELL
LOCATIONS AND ELEVATIONS

DRILL HOLE ID	PROJECT COORDINATES		ELEV. GROUND SURFACE (feet)	ELEV. TOP PROTECTIVE CASING WITH LID (feet)	ELEV. TOP OF PVC W/O CAP (feet)
	Northing (feet)	Easting (feet)			
DH-47	10160.0	49475.6	4228.8	NA	NA
DH-48	10264.2	49468.6	4226.9	NA	NA
DH-49	10108.7	49719.8	4223.8	NA	NA
DH-50	9834.6	49949.7	4228.0	NA	NA
DH-51	9928.0	49817.7	4225.2	NA	NA
SM1-DH1	9756.8	50043.1	4234.8	NA	NA
SM1-DH2	9736.0	50051.5	4235.1	NA	NA
SM1-DH3	9735.7	50032.5	4234.6	NA	NA
SM1-DH4	9702.4	50035.9	4234.9	NA	NA
SM1-DH5	9696.0	50046.2	4234.9	NA	NA
SM1-DH6	9674.5	50046.2	4234.6	NA	NA
TP-SM1-1	9784.5	50047.6	4234.5	NA	NA
TP-SM1-2	9694.0	50059.6	4235.0	NA	NA
TP-SM1-3	9675.0	50040.6	4234.7	NA	NA
TP-SM1-4	9738.2	50029.3	4234.5	NA	NA
SM2-DH1	9935.7	50183.7	4238.4	NA	NA
SM2-DH2	9902.8	50215.4	4239.2	NA	NA
SM2-DH3	9882.9	50205.7	4238.9	NA	NA
SM2-DH4	9873.5	50186.7	4238.8	NA	NA
SM2-DH5	9904.4	50195.3	4239.1	NA	NA
SM2-DH6	9917.7	50228.7	4239.2	NA	NA
TP-SM2-1	9929.0	50205.8	4238.8	NA	NA
TP-SM2-2	9909.1	50185.6	4238.9	NA	NA
TP-SM2-3	9854.5	50213.4	4239.2	NA	NA
TP-SM2-4	9904.8	50240.1	4239.3	NA	NA
TP-SM3-1	9733.1	50322.4	4241.9	NA	NA
TP-SM3-2	9686.5	50251.8	4239.7	NA	NA
TP-SM3-3	9665.2	50263.6	4240.3	NA	NA
TP-SM3-4	9677.6	50075.8	4234.9	NA	NA
TP-SM3-5	9657.7	50219.5	4236.7	NA	NA
TP-SM3-6	9658.3	50101.5	4234.6	NA	NA
TP-SM3-7	9657.2	50155.3	4235.1	NA	NA
TP-SM6-1	9900.8	50170.8	4238.8	NA	NA
TP-SM6-2	9884.6	50157.8	4238.9	NA	NA
TP-SM6-3	9913.7	50157.4	4238.7	NA	NA

NA - Not Available or Applicable

MCT 6/15/94